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REPOR

ON THE

COAST DEFENCES OF ALGERIA,

AT

NEMOURS,
ORAN (including Mers El Kebir),
ARZEW,
MOSTAGANEM,
ALGIERS,
DELLYS,
BOUGIE,
DJIDJELLI,
COLLO,
PHILIPPEVILLE,
BONE,

WITH NOTES ON

BIZERTA AND TUNIS (GOLETTA).

PREPARED IN THE INTELLIGENCE DIVISION OF THE WAR OFFICE FROM INFORMATION OBTAINED IN MAY—JULY—NOVEMBER 1889.

LONDON:
PRINTED AT THE WAR OFFICE,
BY HARRISON AND SONS,
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1889.

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NOTE.

This Report is the result of the observations of military experts who visited Algeria and Tunis in May, June and July 1889, and Algeria in November 1889.

It supplements the information given in the Naval Intelligence Department Report, No. 151, of April 1888, and has been written with the aid of the most recent information available from other sources.

H. BRACKENBURY,
February 1890. *D.M.I.*

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Report on the Coast Defences of Algeria.

INTRODUCTION.

At almost all the Algerian seaports mentioned in this report, the coast defences have been recently reorganized* and work is, in some cases, still going on. The older batteries near the sea level, which were chiefly intended to prevent a landing, are being generally abandoned, and new batteries are being constructed on the heights surrounding the ports and anchorages, so as to bring a plunging fire to bear on hostile vessels.

Everywhere the principles enunciated by Captain Fabre, and quoted in a separate paper published by the Intelligence Division, are being put into application, and it is to these that we must look for a key to the general system of defence.

Formerly, the defences were designed to oppose a landing in force on the coast line, the inland communications were imperfect, and a comparatively small force could, on landing, do serious mischief. A bombardment was not expected, looking to the fact that a great many ships of war would have had to be collected before the combined artillery could hope for any important success. The progress now made in artillery and the possibilities of still greater progress in the future, from the employment of high explosives, have made bombardment a much easier means of offence. On the other hand, the inland communications have been so much improved that the concentration of troops to oppose a landing in force is now greatly facilitated.

The means of observation have also been improved by the construction, within the last year, of new semaphore stations on the coast at—

Cape Matifou ..
Bouzareah Point .. } near Algiers.
Cape Falcon ..
Djebel-Krichtel Point } near Oran.
Cape de Garde, near Bone.
Cape Carbon, near Bougie.

Accordingly, the modern defences of the Algerian seaports are designed to meet an attack by bombardment. The high ground along the coast line favours the use by the defenders of guns of moderate calibre, which are both less costly than the heavy guns which would be required at the lower elevations, and capable of being more rapidly fired.

If the inferences drawn by Captain Fabre, as to the inability of existing British ships (with few exceptions) to engage elevated batteries armed with 24-cm. (9½-inch) B.L. guns be correct, the French, by the fortification of their Algerian seaports, not only protect them from the usual risks of bombardment by hostile cruisers, but also supply to their own cruisers a comparatively safe base for offensive action.

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* General de Miribel, one of the ablest Officers in the French Army, who, it is understood, will be the Chief of the Staff of the French armies in the event of war, was specially sent to Algeria in the spring of 1888, to report on the best arrangements for improving the coast defences. The recent activity in their reorganization may be taken to date from this visit.

Three means suggest themselves for the attack of these ports—

(1.) To engage the batteries, and silence them by means of a suitable ironclad fleet.

(2.) By keeping out of range of the coast batteries, to destroy any hostile vessels in port by long-range fire.

The configuration of the coast line, in some cases, makes this method of attack less favourable than in others. But, generally, all the Algerian ports are exposed to such an attack and hence the importance to the French of a port, like that which could be made at Bizerta, where no such danger would be apprehended.

It would be necessary, of course, for the attacking ships to be armed with guns of heavier calibre or greater range than those mounted in the French batteries, some of which, it will be seen, are of 27-cm. (10·626 inches) calibre.

This method of attack has the disadvantage that, even if successful, it would still leave the port with its defences intact and, therefore, still able to afford a refuge to cruisers.

(3.) Lastly, without necessarily attempting a landing in force, it might be possible to approach the ports either at night, under cover of the darkness, or by other means to surprise and capture the batteries, putting the guns out of action, by the use of gun-cotton, &c.

The decision as to whether this course is practicable depends, to a great extent, on accurate information as to the plan and position of each battery, and of the approaches.

The notes made in this report bear largely on these points.

In considering also how best to attack the defences, it should be remembered that, owing to the limited depression (5 degrees to 7 degrees) which can be given to the heavy guns, there exists round each elevated battery an undefended space which, in some cases, would be of use to the attacking force. On the accompanying maps giving approximately the zones of fire from the coast batteries at the three most important western ports (Algiers, Pl. I., Philippeville, Pl. IX., and Bone, Pl. XI.), an attempt has been made to show this area from data calculated by Captain Fabre in the articles above quoted.

The destruction of the semaphore stations* would be desirable. But these, it will be seen, are either in almost inaccessible positions, or at some distance inland, or protected by the fire of neighbouring forts.

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* As carried out in 1808 on the coast of the Gulf of Lyons. (*See* Lord Collingwood's despatch, 19th October 1808.)

NEMOURS.

NOVEMBER 1889. (*See* Pl. A.)

Defences.

The defences of Nemours, as enumerated by the law* of 15th January 1885, include, in addition to the loopholed self-flanking wall 12 feet high, which surrounds the town on the land side, the following detached works:—

Redoute No. 9.
Redoute No. 12.
Batterie de la Falaise Est (ou ouvrage No. 11).
Fort de Touent (ou ouvrage No. 12).

These would appear to be intended for land defence except, perhaps, the "Batterie de la Falaise Est," which is probably on the high ground east of the town.

In addition to the above, there is the obsolete Batterie du Bastion, No. 8, which was declassed by the law of 27th May 1889. This earthen battery is at the south-west end of the town on the beach. The parapet is 10 feet high and about 12 feet thick, with the ends turned back, as shown in the sketch. It mounts two old B.L. guns of about 5-inch (? 16-cm.) calibre, *en barbette*, on traversing platforms. The enceinte wall of the town is carried out in front of this battery, which could easily be rushed, and is of no value.

Harbour.

In the north-east corner of the bay, which forms the open roadstead at Nemours, is a small ill-sheltered boat harbour. The small breakwater which protects it is about 30 yards long, and there is a quay 10 feet above sea level from A to E, with steps at B, and a hand crane at C. Cargoes are landed on the beach from E to D. All the water within the line AD is shallow, probably not more than 6 feet deep. The beach DE is very shelving, and boats are run on to it, and unloaded by men wading to them; half-a-dozen boats could be unloaded at one time.

Description of the country.

Immediately above this, east of the town, there is a steep sided hill, the top of which must be nearly 500 feet above the sea, and on this batteries could no doubt be placed. Except some old ruined works, no defence works could be seen from below. As has been above suggested, however, the "Batterie de la Falaise Est" is probably on this hill, which can be ascended by means of a road of moderate gradient from F, by which heavy guns could be transported.

In the rear of the town is another hill nearly as high, and on this a battery might be placed, but none could be seen from below.

West of the town the country is flat for nearly a mile, but then rises gradually, with cliffs towards the sea. The western side of the bay can be well seen from the town and the anchorage, and there is believed to be no battery on that side.

The place does not seem worth defending, the anchorage being quite open and the port wretched. The heights east, south, and west would be favourable, should it be proposed to construct batteries.

Land communication.

Nemours can be easily reached by land, as a "diligence" now runs from Tlemcen by Lalla Marnia to it.

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* By the French law no private buildings are allowed to be erected within a certain area in the vicinity of a fort. The forts to which this law applies are specially "classed" as defence works. When a fort becomes obsolete, it is "declassed."

ORAN AND MERS EL KEBIR.*

NOVEMBER 1889.

The modern coast defences of Oran and Mers el Kebir are—

I.—Fort du Santon.
II.—Fort et Batterie Lamoune.
III.—Fort et Batterie Saint Grégoire.
IV.—Batterie du Chateau Neuf.
V.—Batterie du Ravin Blanc.
VI.—Batterie et réduit de Canastel.

There are also the following obsolete or less important works on the sea shore:—

Fort et Batterie de Mers El Kebir.
Batterie de la Briqueterie (obsolete).
Batterie d'Ozara (obsolete).
Fort Sainte Thérèse.

And besides the enceinte wall of the town, the following land defences:—

Fort Santa Cruz.
Lunette Saint Louis.
Lunette San Carlos (or "de la Campana").
Fort Saint André.
Fort Saint Philippe.

I.—*Fort du Santon.* (*See* Pl. C.)

Armament 2—19-cm. B.L. guns. General direction of fire N.E.

This fort (classed 15th January 1885), 4 miles west of the entrance of Oran Harbour, is on the top of a spur of Djebel Santon, forming the promontory at Mers El Kebir. It is at a height of 1,050 feet above the sea, which is about 1,000 yards distant on three sides—west, north and east.

This fort is very difficult to view. The idea of it obtained from scrambling about on the sides of the hill on which it stands, was that its plan is somewhat as shown in the sketch, Plan C.

It is built up of masonry on the top of the hill, and the south-west end (A) is about 15 feet above the natural slopes as seen from the south-west. On this are mounted two heavy guns, probably 19-cm. They face north-east, and it will thus be seen that they are at the rear end of the work. No traverses could be seen. B is the top of the hill, and this is seen above the walls of the north-east part of the work. It must somewhat obstruct the fire of the two guns to the north. The walls round the greater part of this are loopholed, and there appear to be no guns in this part of the work. D is apparently a musketry caponier. The gate is at the re-entering angle C. The ground falls steeply on all sides; to the west it falls only for about 150 feet to a saddle, connecting it with the main hill, which runs about east and west, and is of the same height as the fort.

It is very difficult to get a good idea of the work, as it cannot be overlooked from any point in the neighbourhood. The best view is from the rear, but even then only the portion about A can be seen. It should be approached from the cemetery above the village of St. André, from which a steep zig-zag path leads up to the road just at the saddle above mentioned. The road is a fine piece of engineering, and a coach could be driven down it, if it had parapets. From St. André to the fort by the road must be nearly 3 miles.

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* *See* "Carte Topographique de l'Algérie," sheet No. 153 (Oran), published by the "Depôt de la Guerre," 1883. Scale, $\frac{1}{50000}$. *See* also Plan B.

A fine coast road has now been constructed round the north side of the Jebel Santon from Mers El Kebir, leading to Cape Falcon.

On Plan C is a view of the fort as seen from the hills above Oran at the Chapelle de la Vierge.

There is a Zouave battalion in the citadel of Mers El Kebir, and this finds the guards for the Santon Battery.

II.—*Fort et Batterie Lamoune.* (*See* Pl. D.)

Armament, 3—24-cm. B.L. guns. General direction of fire N.E.

This fort (classed 15th January 1885) is west of Oran Harbour, at the shore end of the breakwater, on a projecting spur of rock, with precipices towards the sea.

The armament is three 24-cm. guns, and the general direction of fire is north-east.

The left gun emplacement is considerably the highest, and faces north. It is sheltered to the west by a built-up traverse, walled in in rear, with a door. This traverse is very conspicuous, and is only about 15 feet thick at the top. A ramp leads down from this emplacement to the general terreplein. The centre emplacement faces rather north of north-east. The gun is traversed to the left by the highest part of the fort, and could not fire much west of north. A parapet of the same height as that over which the gun fires, runs along the right of the emplacement and back nearly to the gorge. The work appears to have been originally constructed for only two guns.

The right gun emplacement is about 10 feet below the bend of the general terreplein, from which it is reached by the passage E. The emplacement faces north-east, and the gun cannot fire west of north, owing to the high parapet separating it from the centre emplacement. This parapet has a revetment wall about 10 feet high. Along the right and rear of this gun emplacement there is merely a low masonry wall, this part being all built up of solid masonry above the breakwater.

The rear of the battery is closed by a 12-ft. loopholed wall, and at B there is a caponier of the same height.

The battery can be well seen from the road and from the pier, and a good distant birdseye view of it can be obtained from the Chapelle de la Vierge on the hill above.

The parapets appear to be partly solid rock and partly built up of masonry. The guns are very conspicuous. The figures given in the sketch plan show approximately the elevation of different parts of the battery above the sea.

Plan D also gives a view of the battery as seen from the end of the breakwater.

III.—*Fort et Batterie Saint Grégoire.*

A new battery is being constructed on the site of this old masonry fort, which is on a spur of the Djebel Murdjadjo, west of the town of Oran, 554 feet above the sea, from which it is about 500 yards distant on the north and on the east at the harbour.

In November 1889, beyond the construction of a carriage road from the Kasba up to the site, and the demolition of part of the old fort, little had been done, but about 200 disciplinaires were engaged on the work. Heavy blasting was in progress, and it seems probable that the battery will mount three guns, certainly not more, as the space is very cramped. The old fort is a solid mass of masonry, and part of this will probably be cut down and formed into emplacements. The position is good and there will be a great range of fire, but the battery will be very conspicuous. It can be very well seen from the Chapelle de la Vierge, which is about 400 feet higher up, and which is approached by way of the Kasba. This hill is very steep and rugged, almost precipitous in places, especially on the side towards the sea. In its lower parts towards the town the slopes are perpendicular.

IV.—*Batterie du Chateau Neuf.* (*See* Pl. E.)

Armament, 1—24-cm., and 1—19-cm. B.L. guns. General direction of fire N.

On the commanding Chateau Neuf there are only two guns, mounted near its eastern end, firing due north at a height of about 250 feet above the sea.

The old Chateau Neuf is built upon a plateau above the harbour with ravines on either side. Its escarps are thus completely exposed. They have a general height of about 25 feet. On the harbour side the steep slopes below are terraced with walks and form gardens.

The battery in question has been constructed on the top, as shown in the sketch, and stands back a few yards from the escarp. It is of earth and mounts two guns *en barbette*. The left one appears to be a 19-cm., and the right a 24-cm. The left emplacement is protected on the left by a high traverse, apparently about 15 feet above the terreplein. The right emplacement is about 3 feet lower than the left, and separated from it by a traverse about 10 feet high, not so long or solid looking as that to the left.

There are no buildings at this end of the Chateau, but the remainder of its area is crowded with barracks, stores, &c.

This two-gun battery cannot be well seen from anywhere near, as it is higher than any accessible ground within a ¼ mile. Strangers are not admitted into the Chateau. It is, however, very conspicuous, and the guns can be seen from the Mole, the hills west of Oran, Ravin Blanc, &c.

Owing to the traverses, it is probable that the guns could not fire much west of north-west.

V.—*Batterie du Ravin Blanc.* (*See* Pl. F.)

Armament, 4—24-cm. B.L. guns, 1—16-cm. B.L. gun. General direction of fire N.N.W.

This is an earthern battery, 1,500 yards from the entrance of Oran Harbour, mounting four 24-cm. guns and one smaller gun. The battery faces generally north north-west, and is from 200 to 230 feet above the sea. The four 24-cm. guns are mounted *en barbette*; the ground rises from west to east, therefore the west or left emplacement is considerably lower than that on the right. To the left of each gun emplacement is a traverse about 12 feet above its level, and about 26 feet wide at the top. The sketch on Plan F gives a plan of the battery, and explains its general detail. The platform of the right gun appeared to be about 12 feet higher than that of the left gun.

On the west side of the battery there is a low earthen parapet, and a B.L. gun on a traversing platform is mounted here, facing the port. This appears to be about a 5-inch gun (? 16-cm.). The rear of the battery is closed by an irregular shaped 12-ft. wall, loopholed. The right or east flank is closed from A to B (sketch) with a wall, while from B to C there is a cutting, about 10 feet wide at the sole, with perpendicular sides, the rising ground being made use of; in addition to this cutting there is the parapet shown in the sketch. About D there is what appears to be a magazine. There is also probably magazine accommodation in the platform E; this is revetted with masonry from G to B, the ramps shown in the sketch leading up to DG, and is probably entirely natural soil.

The first and third from the left of the traverses, between the gun emplacements (HK), are revetted partly with masonry at the back, but show no doors, so apparently the magazine accommodation is all in rear.

To the north and west are precipices descending to the sea. To the east the ground rises gradually. In the rear the ground is level as far as the railway cutting.

This battery can be seen fairly well from the rear, and from the higher ground to the east. Owing to the traverses, the range of the three left guns is somewhat limited on both sides, but the right gun can fire right along the line of cliffs to the east.

VI.—*Batterie et réduit de Canastel.*

This battery was classed by the law of the 27th May 1889, and is probably near Canastel Point, 6 miles north-east of Oran Harbour, on the cliffs, which are there about 750 feet above the sea.

A road leads from Oran along the top of the cliffs in this direction over a very open stony moorland, on which there is nothing to obstruct the view.

OBSOLETE COAST DEFENCES.

The old fort or citadel on the promontory, although of very solid construction, is of no value now for coast defence, and no guns are, as far as could be seen, mounted on it. Strangers are not permitted to pass the gate.

Fort de Batterie de Mers El Kebir. (*See* Pl. E.)

At the end of the breakwater is the "Batterie de Mers El Kebir." This battery was declassed by the law of 27th May 1889. In November 1889, however, a heavy gun was mounted, apparently of 24-cm. calibre, facing north-east, *en barbette*. To the west is a high traverse, as shown on the sketch, Plan E, with command of about 8 feet above the parapet, and there is a somewhat lower traverse to the south, apparently to shelter a gun emplacement just north of the lighthouse; but no gun could be seen in it. The traverse A appears to be a magazine, as it can have no object, unless to shelter a gun firing south on to the harbour. It is difficult to see into this work, but there appeared to be only the one gun mounted in it, and it is doubtful if there is room for another heavy gun. If a boat were taken at the village the place might be seen from the seaward.

The gun shown in the plan has a command of about 25 feet above the sea. The old citadel stands on somewhat higher ground.

Batteries "de la Briqueterie" and "d'Ozara."

The "Batterie de la Briqueterie" and the "Batterie d'Ozara" are low-lying batteries on the south-east shore of the bay of Mers El Kebir. They were declassed by the law of the 15th January 1885, and are dismantled and out of repair, and could only be used by infantry to oppose a landing on the beach.

Fort Ste. Thérèse.

This is an old masonry fort on a precipitous projection, opposite the entrance to Oran Harbour, a little east of the Chateau Neuf, and lower down. The muzzles of two guns project from portholes in its northern face. They are in a casemate; but, looking down on this from near the east point of the Chateau Neuf, the casemate appears very small, and it is doubtful if the guns are of modern date. The masonry about the portholes looks very shaky, and the guns may probably be disregarded. They could only be seen by going into the fort, which is not permitted.

LAND DEFENCES.

Oran is completely surrounded, except when precipices render it unnecessary, by a solid wall, 15 feet high, loopholed and flanked at intervals. The old works, Santa Cruz, Lunette St. Louis, Kasba, Fort St. André, Fort St. Philippe, &c., are quite out of date, but would, of course, be valuable against field artillery, and some of them are in almost inaccessible positions.

SEMAPHORES.

New semaphore stations have been erected on either side of Oran Bay—

(1.) On the west, at Cape Falcon, apparently about a mile south-west of the lighthouse, and 300 feet above the sea.

(2.) On the east, at the highest point of Djebel Krichtel,* about 2 miles inland south-east of Abuja Point, and nearly 2,000 feet above the sea.

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* *See* "Carte Topographique de l'Algérie," sheet No. 127 (Arzew), published by the "Depôt de la Guerre," 1883. Scale $\frac{1}{50000}$.

ARZEW.

NOVEMBER 1889. (*See* Pl. G.)

The "classed" defences of Arzew, in addition to the self-flanking enceinte wall 12 feet high, with the attached "Redoute de la Plaine," include the following detached works:—

Fort de la Pointe.
Fort et Batterie du Nord.
Redoute de la Montagne Coteé, 13.
Batterie du Sud.
Blockhaus du Champ de Tir (classed 27th May 1889).

There used also to be a battery at the "Fort de la Pointe," but this has been declassed by the law of 27th May 1889.

None of the above-mentioned works are of importance as coast defences.

Armament, 2—19 or 24-cm. B.L. guns. General direction of fire E.

A new battery, however, was in November 1889 in process of construction and armament at the point marked C on the sketch plan.

It is situated below the Fort du Nord, on the forward slope of a wooded spur above the breakwater, at a height of about 200 feet above the sea. One gun was mounted, the other was being mounted. The calibre appeared to be 19-cm., but might possibly be 24-cm., as the view of the battery was obstructed by trees. The battery appears to be of the usual type, the guns being mounted *en barbette*. It will probably have no wall in rear, owing to the rise of the ground. On looking down from near A, no arrangements could be seen having the appearance of magazine accommodation.

The battery can certainly be enfiladed from about east-north-east.

Fort de la Pointe.

(*See* inset sketch plan on Pl. G.)

This closed work is situated at the shore end of the breakwater (at D on the sketch plan). The battery on the sea face (declassed 27th May 1889) faces a little south of east.

It is intended for two guns to face east-south-east, but none are mounted. A B.L. gun, probably 16-cm., was lying on skids in the battery. It doubtless formed part of the former armament. There are two high traverses as shown to protect against enfilade, and a large bank to the right rear, probably a magazine. There are two M.L. guns on the south side facing south on to the harbour, they are on standing garrison carriages.

The rear is closed by a 10-ft. wall, loopholed. The whole stands on the natural platform that is to the north of the harbour, and about 20 feet above sea level. As it stands, it is of no importance, but with a little labour, and the partial cutting down of the traverses, it could be made to bear guns firing north-east, and guns could easily be put into it at any time.

Fort et Batterie du Nord.

The Fort du Nord is a regular lunette fort, 276 feet above the sea, with a parapet of about 15 feet command, a ditch 30 feet wide and 20 feet deep, and masonry escarp and counterscarp. It is singularly placed, having, as a land defence, no range to the north-west, owing to rising ground, and only limited range to the east-north-east towards the sea. There are no embrasures, and apparently no guns mounted. There are barracks and troops inside, and the bridge at the entrance is guarded. This entrance is by a hollow gateway under the parapet. At the south-east corner is a small musketry caponier, as shown on the sketch. The ramparts are very conspicuous. Although of elaborate construction, and probably not more than 15 years old, this fort is of little value as a coast defence. Its dimensions along the crest would be approximately as follows: faces, 60 yards; flanks, 30 yards; gorge, 100 yards.

Redoute de la Montagne Cotée, 13.

The position of this redoubt was not identified. It is doubtless for land defence only.

Batterie du Sud.

(*See* inset sketch on Pl. G.)

Armament, 2—16-cm. B.L. guns, two smaller M.L. guns. General direction of fire N.E.

The Batterie du Sud is about 1,000 yards south-east of the town on the shore, as shown in the Admiralty chart No. 1766. It faces about east-north-east to north-east. It is an earthen battery with a command of 25 feet, and mounts four guns *en barbette*. The two guns of the right half-battery are old B.L. guns, about 5-inch (? 16-cm.), on traversing platform; the other two are old M.L. guns on standing carriages.

The parapets are about 20 feet thick. In the centre is a traverse about 5 feet higher than the parapet, and quite 30 feet wide, with doors. The terre-plein is raised about 10 feet above the country along the shore, with a masonry escarp to the rear and low parapet wall. There is a shallow unrevetted ditch round the land side. The entrance is over a drawbridge and through a defensible barrack (shown shaded in the sketch).

This battery, owing to its command and position on level ground, is very conspicuous, and it is of little importance. It can be well seen from the road in rear.

Blockhaus du Champ de Tir.

This was classed by the law of 27th May 1889, and in November 1889 was in process of construction at the point marked B on the sketch, which is near the rifle range, and about 360 feet above the sea. It had, apparently, only recently been begun, civilians, superintended by a few non-commissioned officers and an Officer, being employed on the work. Though it was difficult to get a good view of the work, it seemed possible that emplacements for guns to fire in a north-easterly direction were being prepared. Attention should therefore, on a future occasion, be given to this point.

COMMUNICATIONS.

A good military road (shown on the sketch) leads up from the south part of the town to the Fort du Nord, and has been continued to the site of the Blockhaus de Champ de Tir.

NOTES ON THE HARBOUR, &c.

Arzew, which is the terminus of the narrow-gauge railway to Ain Séfra, is looked upon as a place of considerable importance, and much activity is being displayed on the new defences.

It is said to be the best natural port on the Algerian coast, and it has been furnished with a breakwater about 400 yards long.

There should be shelter in the port during all winds, and there is plenty of room. There are two jetties at E and G in the sketch. That at E is of wood and iron (50 yards long), and the depth of water at its end is fully 15 feet. The railway (narrow-gauge) is continued round from the station on the shore at the centre of the town to the jetty E, where there are turntables. A rough continuation also runs out nearly to the end of the breakwater. Between the jetties E and G, the water gradually becomes shallower going south, and only small vessels can come alongside. G is a stone jetty, with about 8 feet of water at the end and 40 yards long. Between E and G there is a low quay about 4 feet above sea level. South of G there is a beach, the water becoming shallower going to the south. The breakwater is not constructed for ships to run alongside.

There are no naval establishments at the place and the trade appears to be small.

Arzew has a bad water supply, although brackish water is brought down in abundance by irrigation channels from the hills for agricultural purposes.

Approach of new works.

Strangers are not permitted to visit any of the higher ground, "terrain militaire." By going northwards along the coast and then striking over the hills, the work near the Champ de Tir could probably be seen from the north-west, and by walking back towards the Fort du Nord a good view of the whole system could be obtained. It is possible to get up through the woods, unseen.

MOSTAGANEM.

NOVEMBER 1889.

The defences include besides the enceinte wall with the attached "Reduit de Matemore" and "Fort de l'Est," intended for land defence, one detached work for coast defence, namely, the

Batterie du Camp (classed 15th January 1885).

Armament, 2—16-cm. B.L. guns. 2 smaller M.L. guns. General directions of fire W.N.W.

This is an earthen battery overlooking the harbour, about 250 feet above the sea, 300 yards west of the town, and about 100 yards south of the road leading down to the harbour.

The battery faces west north-west and is for four guns having a command of about 10 feet. In the middle is a high and conspicuous traverse, 20 feet high and about 20 feet thick at the top, unrevetted except at the back. There are two guns each side of this traverse, those next to it being old M.L. on garrison carriages (if rifled, not seen, owing to the tampions); the two outer guns are old B.L., about 5-inch (? 16-cm.), on traversing platforms. All work *en barbette*. There is a slight splay of the faces.

The front and sides are surrounded by a cactus hedge and there is a high wall at the back forming part of an enclosure.

The parapet is not more than 20 feet thick. There are two doors in the rear of the centre traverse which is probably intended as a magazine.

This battery is really valueless for coast defence.

LAND DEFENCES, &c.

The town is surrounded by old walls of no value whatever. The Fort de l'Est is at the eastern corner with considerable command, but valueless except against native attack and apparently unarmed.

Matemore appears to be the name given to the south-west part of the town which is entirely French, and cut off from the remainder by a deep and walled ravine.

The port of Mostaganem is merely a small boat harbour with a few buildings near it. The town is on a plateau 300 feet above the sea. An excellent road descends to the port with two or three zigzags. The port was only viewed from the high ground above.

Mostaganem is now in connection with the Algerian railways by a branch line to Relizane.

ALGIERS.

(MAY—JULY—NOVEMBER 1889).

Description of the country. (*See* Pl. I.)

The country which encloses the Bay of Algiers is divided into two portions by the River Harrach, which flows into the south of the bay. To the west are the plateaux and hills of the Sahel, to the east is the fertile plain of Metidja. The high lands on the west culminate at the villages of Bouzarea (altitude 1,200 feet) and El Biar (altitude 800 feet), between which and the sea, to the north-east, lies a valley (Le Frais Vallon), formed by several watercourses, which descend from those villages, and unite near the sea, at the suburb of Bab El Oued.

The valley is bounded on the north-west by a level spur which runs out from Bouzarea, north-east to the observatory (La Vigie, altitude 1,100 feet), and there bifurcates into two subsidiary spurs which descend the one east, past the Marabout of Sidi Ben Nour (altitude 870 feet), where a new battery is being erected to the sea at Bab el Oued, and the other north, past a new semaphore station (altitude 1,065 feet), to the sea, midway between the village of St. Eugène and Pointe Pescade.

From the line of heights, Sidi Ben Nour—Vigie—Semaphore, which run parallel to the shore, and about 1,500 yards inland, the ground towards the sea at first slopes steeply till a lower plateau, called the Vallée des Consuls, is reached. This plateau, which is reached by a carriage road from Bab El Oued, ends immediately above the village of St. Eugène in three minor spurs, occupied respectively by the church of Nôtre Dame d'Afrique (altitude 440 feet), a very prominent white building, the Petit Seminaire (altitude 425 feet), partially concealed by trees, and a four-gun battery, the Fortin de l'Ouest (altitude 475 feet), close to the former British Consulate. From the ends of these spurs the ground again slopes steeply to the coast road near the sea level. A narrow strip of land between the sea and the road is occupied by the village of St. Eugène.

Returning to the high ground at Bouzarea, we find, on the north, a number of spurs descending to the sea near Pointe Pescade, where there is a small bay with sandy beach, and two old masonry blockhouses, now occupied by the coastguard, whilst, to the south of Bouzarea, the watershed circles round the head of the Frais Vallon Valley to El Biar, whence a spur descends in a north-easterly direction to the sea at Point El Kettani. The slopes of this spur, on the one side, form the south-eastern boundary of the Frais Vallon Valley. The slopes on the other side, at the northern end of the spur, form the site of the town of Algiers, and overlook the harbour. The ridge of the spur, for about a mile from the Point El Kettani, is occupied by one face of the bastioned enceinte enclosing the town. The other face of the enceinte is carried down the slopes from the Porte du Sahel (altitude 500 feet) to the sea at the end of the southern breakwater.

Half way along the ridge, between the salient of the enceinte at the Porte du Sahel and El Biar, is the old Fort de l'Empereur (altitude 670 feet).

From El Biar again, a line of heights, gradually decreasing in altitude, extend in a south-eastern direction, past Mustafa Superieur, along the southern shores of the bay, at less than a mile from the sea, as far as the Koubba Seminary (altitude 460 feet), a large prominent white building, above the village of Hussein Dey. From Koubba the ground gradually falls away eastwards to the River Harrach.

The El Biar—Koubba heights are broken by a watercourse which rises behind them near El Biar, and passing by the village of Birmandreis, and through the ravine of the Femme Sauvage (or Oued Knis), falls into the sea between the Jardin d'Essai and Hussein Dey.

Above the Jardin d'Essai, where the heights approach nearest to the sea, a four-gun battery ("Batterie des Arcades") is in process of completion and armament. Its position (altitude 425 feet), which is 200 yards east of a prominent white villa on the hill called "Les Arcades," is partly concealed from seaward by a wood on the east. It can be reached by a road to El Biar, which ascends the face of the hill from the principal entrance to the Jardin d'Essai, towards what is known as the Bois de Boulogne at Mustafa Superieur. A better view of the battery is obtained, however, in descending to the Jardin d'Essai by this road.

The Metidja plain, which bounds the eastern half of the Bay of Algiers, is slightly undulating. On the promontory, near Cape Matifou, is a wooded hill nearly 250 feet high, and about half a mile inland, on which is the lighthouse, a new semaphore station, and the Fortin de Temendfous, a closed work of recent construction, armed with four heavy guns.

Close to the sea, at Cape Matifou, and on the Algiers side, is the quarantine station, consisting of about half-a-dozen detached buildings, near which is an old masonry blockhouse, now used as a coastguard station.

COAST DEFENCES.

Coast defence.

The modern coast defences of Algiers, as defined by the laws of 15th January 1885 and 27th May 1889, are—

Within the enceinte—

Fort du Musoir Nord.
Fort du Musoir Sud.
Fort du Coude de la Jetée.
Batterie de la Prison Civile (classed 15th January 1885).
Batterie de la Salle d'Artifice (classed 15th January 1885).
Batterie de la Courtine, 10—11.
Batterie de la Courtine, 12—13 (classed 15th January 1885).
Batterie du Cavalier, 24—1 (apparently for land defence only).

Detached Works.

Fortin de Temendfous.
Maison Carreé (for land defence).
Batterie des Arcades (classed 27th May 1889).
Fort de l'Empereur (for land defence).
Batterie de Sidi Ben Nour (classed 27th May 1889).
Fortin de l'Ouest.

By the law of 27th May 1889, the following were declared obsolete:—

Within the enceinte—

Batterie de l'Ilot de la Marine.
Batterie du Bastion, 15.

Detached Works.

Batterie Charles Quint.
Fort des Anglais.

Generally, the coast defences of Algiers consist of a number of small batteries of heavy guns recently constructed at considerable elevation above the sea, and scattered round the bay, from which a concentrated plunging fire can be brought to bear on hostile vessels which might attempt to enter the harbour, or take up a position from which the shipping and stores there could be destroyed. The fire of these batteries was, till recently, supplemented at the port by that from the older works on the seaboard, which, in some cases, had been strengthened for heavy armament, but now it appears that all the lower works are to be dismantled.

The defences may be conveniently described in three groups, those within the enceinte or town of Algiers, and those respectively to the east and west of the town.

1. Within the town of Algiers—

(*a.*) Earthen batteries on the seaboard, strengthened for heavy guns—

The arsenal at Point El Kettani (one heavy gun mounted in May, dismounted in July).
The Lighthouse Fort (four heavy guns, nine light guns, in position in May but being dismounted in July).
Bab Azoun Battery (unarmed).

(*b.*) Masonry batteries on the seaboard, comparatively obsolete—

Fort Neuf (unarmed).
The three stone forts on the breakwaters (unarmed).
Alefna Island Battery (unarmed).

(*c.*) Elevated earthen batteries on the hill slope at the back of the town—

Below the Civil Prison (three light guns).
Below the Salle d'Artifice, or cartridge factory (three heavy guns).
Near the right flank of Bastion 11 (four heavy guns).
Near the curtain between Bastions 12 and 13 (four heavy guns).

The general direction of the fire from this group of batteries is to the eastward, directly defending the entrance of the harbour, and covering the approaches from the south-east and north-east.

2. East of the town of Algiers—

(*a.*) Earthen batteries on the seaboard—

Batterie Charles Quint, and practice batteries at the Polygone d'Artillerie, east of Hussein Dey (one light gun mounted).
Battery 1,000 yards west of the embouchure of the Hamiz stream (unarmed).
Battery at the extremity of Cape Matifou.

(*b.*) Masonry blockhouses on the seaboard at—

Fort de l'Eau and Cape Matifou (now coastguard stations).

(*c.*) Elevated earthen batteries—

On the hill above the Jardin d'Essai, near "Les Arcades" (in process of armament with four heavy guns).
Temendfous Fort, near the lighthouse at Cape Matifou (four heavy guns).

The fire from this group of batteries flanks the approach to the harbour from the eastward, and covers the anchorage at the south of the bay, from which the harbour might be shelled.

3. West of the town of Algiers—

(*a.*) Earthen batteries on the seaboard—

Batterie des Anglais and Batterie des Consuls (unarmed and obsolete), respectively east and west of the village of St. Eugène.

(*b.*) Masonry blockhouses at—

Pointe Pescade (now a coastguard station).
Fort des Anglais.

(*c.*) Elevated earthen batteries above St. Eugène—

Fortin de l'Ouest (four heavy guns).
Fort Sidi Ben Nour (in construction for (?) four heavy guns).

The fire of this group of batteries flanks the approach to the harbour from the westward, and covers the anchorage near St. Eugène, from which the harbour might be shelled.

COAST DEFENCES WITHIN THE TOWN OF ALGIERS. (*See* PL. II.)

The Arsenal Battery.

Unarmed. General direction of fire N.E.

This battery consists of a straight line of thick earthen parapet (altitude 60 feet) facing north-east, closed in rear by the Arsenal buildings, except at the southern end, which opens on to the Esplanade Bab El Oued. At this end are five high traverses, with emplacements between them, each for one gun to fire *en barbette.* Three of these emplacements open on to the Esplanade Bab El Oued.

Near the north end of the battery, within the arsenal, are three similar emplacements with traverses.

Only one gun was mounted in May 1889, this a B.L. gun, apparently of 19-cm., was at the most southerly emplacement. In July this gun had been dismounted and removed.

The exterior slope of the battery can be approached by the road to the Bains Nelson, leading past the Fort Neuf, and along the foot of the slope. To seaward are the military Engineer workshops and a covered way, from which the armament of the battery can be observed.

Admission to the arsenal is forbidden.

Batterie de l'Ilot de la Marine.

or

The Lighthouse Fort.

In process of dismantlement. General direction of fire N. and E.

The interior of this fort can be seen from the lighthouse on the Presqu'ile de la Marine. A thick earthen parapet (altitude of interior crest about 40 feet) extends along the north and east faces on the top of casemates, closed in front by a retaining wall, 20 to 30 feet high. This wall, which is completely exposed to fire, has been recently strengthened on the north face, and near the south end of the east face. At each of these points two heavy guns (? 24-cm. B.L.) were mounted *en barbette,* separated by high traverses. On the east face, between these guns, nine lighter guns were mounted also *en barbette,* of which four are M.L. guns (? canons de 12), and five B.L. (? canons de 7). Behind the north-east corner a large earth-covered magazine has been constructed in the courtyard, access to which is given by a ramp from the neighbourhood of the lighthouse.

In rear of the heavy guns at the south end of the east face, and concealing them from the town, are the Admiralty buildings, of which the lower rooms are now used as a workshop for torpedo boats. The splinters from these buildings would doubtless be dangerous to the gun detachments in action.

By the law of 27th May 1889, this battery is declared obsolete, and in July 1889, the dismounting of the guns had commenced. In November 1889 all the guns had been dismounted.

Batterie du Bastion, 15,

or

Bab Azoun Battery.

Unarmed. General direction of fire E.

This battery, which faces east, and is on a level with the Boulevard de la Republique, consists of an earthen parapet (altitude 50 feet) on casemates in front of the masonry fort of the same name, now used as a military prison.

There are five high earthen traverses with emplacements for six guns *en barbette.* At present no guns are mounted. The masonry retaining walls, which support the battery, are exposed to fire from the sea, and by the law of 27th May 1889, this battery is declared obsolete.

MASONRY BATTERIES AND FORTS ON THE SEABOARD.

The three small batteries on the breakwaters are still unarmed and dismantled.

Fort Neuf is used as a barrack for the Engineers, and appears also to be dismantled.

Bab Azoun Fort is used as a military prison.

Alefna Battery is in ruins, and the island is used as a coal store.

ELEVATED EARTHEN BATTERIES.

Batterie de la Prison Civile.

This is an open earthen battery of 3—16-cm. B.L. guns *en barbette,* facing north-east, and about 325 feet above the sea. It adjoins the Boulevard Vallée, on the north at the angle formed the Rampe Vallée, about 100 yards below the Civil Prison. The guns command the arsenal and the sea beyond. The parapet is about 20 feet thick, and the work generally is not of a formidable character. One traverse separates two of the guns from the third.

Armament, 3—16-cm. B.L. guns. General direction of fire N.E.

Batterie de la Salle d'Artifice.

This earthern battery, which is concealed in front by a plantation of young trees, is situated at about 400 feet above the sea, on the spur immediately below the Salle d'Artifice or cartridge factory. It is entered from the upper bend of the Rue Rovigo, and is shut in in rear by the enclosure wall of the factory.

Armament, 3 or 4—24 or 27-cm. guns. General direction of fire E. by S.

The parapet is of considerable thickness and provided with traverses, which separate the guns mounted *en barbette.* These B.L. guns appear to be three in number, of at least 24-cm., and possibly 27-cm. calibre, and fire on the entrance to the harbour east by south. In May 1889, the traverse and parapet on the right of the battery were being strengthened, probably for the protection of a magazine.

Batterie de la Courtine, 10—11.

Battery near the right flank of Bastion 11.

This is also an open earthen battery, concealed in front by a plantation of young trees. The guns, which are four in number, B.L., of 24-cm. (possibly 27-cm.) calibre, mounted *en barbette,* and separated by thick traverses, are at an elevation of 370 feet above the sea, and fire east on the entrance to the harbour.

Armament, 4—24 or 27-cm. guns. General direction of fire E.

The battery adjoins on the north the road leading from the Porte du Sahel to the Porte d'Isly along the ramparts of the enceinte. It is surrounded by an open paling. A sentry is on guard, and there is doubtless a filled magazine in one of the traverses.

Owing to the form of the ground, the gun emplacements are at different levels, the left or north gun being the highest.

Batterie de la Courtine, 12—13.

Battery between Bastions 12 and 13.

This earthen battery, at about 210 feet above the sea, is on the high ground inside the curtain between Bastions 12 and 13.

Armament, 4—24 or 27-cm. B.L. guns. General direction of fire E.

It fires east on the entrance to the harbour, and is very much concealed by a plantation in front. The site of the battery can be approached by the road which leads up the ramparts from the Porte d'Isly into Bastion 12, the battery adjoins this road on the north, but access to the interior of the battery is prevented by an open paling with a gate which shuts it off.

Owing to the form of the ground, the pair of guns on the left of the battery (*i.e.* north) are on a higher level than the other two, the difference being from 10 to 20 feet.

Bastion 12 forms a sort of reduit and commands the battery. The road enters the bastion by an arched gateway through the retrenchment. The bastion can also be entered by a path from the casemates in the adjoining curtain (between Bastions 12 and 11) where, however a sentry is on guard to prevent admission.

The four B.L. guns mounted in this battery appear to be of 24 or 27-cm., separated by thick traverses, and firing *en barbette.*

Batterie du Cavalier, 24—1.

This must be the Cavalier at the highest point of the town above the Porte du Sahel. Admission to the interior is prohibited, but it would appear that the object of the work is for land defence. No guns could be seen in position in May 1889, either from the sea or from the land side near the Fort de l'Empereur. A sentry, however, was posted in the work.

COAST DEFENCES EAST OF THE TOWN OF ALGIERS.

(*See* Pl. I.)

Batterie Charles Quint.—Polygone d'Artillerie.

Unarmed. General direction of fire N.E.

This is a small earthen battery, facing north-east, on a sand hill, close to and north of the railway, about 600 yards east of the railway station of Hussein Dey. Only one B.L. gun, apparently 155-mm., could be seen in position from the railway in May 1889. Two M.L. guns (canons de 12?) were lying dismounted behind the battery.

By the law of 27th May 1889, this battery is declared obsolete.

A detachment of artillery was encamped in the neighbourhood for the summer practice.

The earthen battery, further east, near the mouth of the Hamiz stream, is not of recent construction. From the carriage road, about $\frac{3}{4}$ of a mile inland, it appeared to be closed with a wall in rear, but unarmed. The parapet is of considerable height, and there appeared to be room for four guns of moderate calibre, or two heavy guns.

The small earthwork at Cape Matifou is apparently unarmed and obsolete.

Masonry Blockhouses.

The masonry blockhouse at Fort de l'Eau, which is the name of a small seaside village, at the south of the Bay of Algiers, and that at Cape Matifou, near the Quarantine Station, appear to be similar in construction.

That at Fort de l'Eau is built of solid masonry, about 30 feet high and 50 feet square, on plan, in two storeys, surrounded by a small ditch. The parapet on the roof is arranged for musketry. The entrance is on the land side. Its position, close to the sea, on a bank about 20 feet high, is very favourable for coastguard purposes. The neighbouring village is in telegraphic communication by a land line with Algiers.

An Officer and six men are stationed here, and probably the same number at Matifou.

In their present state it would be difficult to capture these buildings without Artillery.

Batterie des Arcades.—Battery above the Jardin d'Essai. (*See* Pl. III.)

Armament, 4—27-cm. B.L. guns. General direction of fire N.E.

This battery, which is more than 2 miles from the mouth of the harbour, and about 425 feet above the sea, was under construction in May 1889.

The earthwork was complete, but the wall closing the gorge and the masonry were still unfinished. Parts of the carriages were in position, and preparations were being made for bringing up the guns and mounting then.

In July the guns were mounted, and by November the battery appeared to be practically complete, though there were still some 150 disciplinaires engaged upon it.

The general direction of fire is north-east.

The armament is four 27-cm. B.L. 20-ton guns, firing *en barbette.* Each emplacement appears to be cut out of the ground, and is separated by a merlon of solid ground forming a traverse, and designed so as not to be seen above the parapet.

Close in rear of the left gun emplacements, and parallel to the front of the battery, is a barrack with red-tiled roof. The site for this barrack has been excavated to a considerable depth, so as to conceal the building from view.

The magazine accommodation would appear to be mined out of the natural soil, which has been left standing at the south-east end of the battery.

The gorge is closed by a loopholed, self-flanking, wall, about 12 feet high, which at the south-west corner forms one of the walls of the barrack.

The gate is at the west corner close to the barrack.

The battery can be approached by a road leading to the Jardin d'Essai from the Colonne Voirol and El Biar. It can also be approached from Algiers by following the road west of the Champ de Manœuvres, and taking the road to the right, where it bifurcates after about a quarter of a mile. By ascending and following the rough lane along the crest of the hills, you come right down on the battery, and can then descend to the Jardin d'Essai. The battery is commanded by the plateaux in rear towards Birmandreis, to which several roads and paths from the ravine of the Femme Sauvage (Oued Knis) give access.

Fortin de Temendfous. (*See* Pl. IV)

Armament,
4—27-cm.
B.L. guns.
General
direction of fire
W. and S.W.

Owing to its isolated position, 10 miles from the entrance to the Port of Algiers, this fort is necessarily a closed work. The hill on which it is built, is surrounded by the sea, at a distance of ¼ to ½ a mile on the west, north and east.

The trace and details have, therefore, been designed specially for protection from enfilade and reverse fire, and are concealed by a plantation of young trees.

The four heavy B.L. guns (? 27-cm.) in position are mounted *en barbette,* 240 feet above the sea, on two faces, which fire respectively west and south-west, *i.e.*, towards the Port of Algiers and the anchorage along the south of the bay. The guns on the former are separated by thick and high traverses. Those on the latter are protected from the north by a high parados, which forms the north face of the work.

At the south-west corner is an emplacement for one or two field guns to fire *en barbette.*

The south and east faces are apparently intended for defence by musketry fire.

The fort is surrounded by a ditch, partly cut in the rock, about 20 feet wide and 15 to 20 feet deep, flanked by small low caponiers and escarp galleries for musketry or mitrailleuse fire. The escarp and counterscarp are of masonry and vertical. The entrance, closed by a bullet-proof gate, bearing the date of 1887, is over a light iron bridge at the south-east corner of the work. One of the traverses of the west face appears to be prolonged across the centre of the work to cover the entrance. The ventilators on the top of this indicate the existance of bomb-proof casemates.

The road from Matifou village, which lies about ¾ of a mile to the south-east, to the lighthouse, situated on the same hill as the fort, and 100 yards north of it, appears formerly to have led over the site of this work. It now leads up to the entrance and along the front of the battery.

The lighthouse is about 40 feet high. This is not sufficient to allow of all the details of the fort being visible from the top.

Close to, and north of the lighthouse, is the new semaphore station, which was on the point of completion in May 1889.

COAST DEFENCES WEST OF THE TOWN OF ALGIERS.

(*See* Pl. I.)

The earthen batteries on the seaboard are unarmed and obsolete. The profile is weak, and there does not seem to be any intention at present of utilizing them; they would, however, afford cover to infantry to oppose a landing. The old masonry Fort des Anglais has been declared obsolete by the law of 27th May 1889.

The masonry blockhouses at Pointe Pescade are similar to that at Fort de l'Eau already described. They are on either side of the road at the point, and are occupied by one Officer and six men of the coastguard, of whom one man is always on duty as a lookout and one is on patrol. These buildings would be specially useful to oppose a landing in the small bay west of Pointe Pescade.

ELEVATED EARTHEN BATTERIES.

Fortin de l'Ouest. (*See* Pl. V.)

Armament, 4—24-cm. B.L. guns. General direction of fire N.E.

This earthen battery is about 100 yards north-east of the former residence of the British Consul in the Vallée des Consuls, on a spur west of the village of St Eugène, and 475 feet above the sea.

The general direction of the fire from its four guns is north-east, but the gun on the left can fire in the direction of Pointe Pescade. The guns are B.L., apparently 24-cm. each, separated by high traverses, provided with shell-filling rooms. The parapet is enclosed by low walls on each flank and along part of the front. These are flanked by demi-caponiers for two or three rifles. At the salient is a perpendicular scarped rock, descending about 20 feet. The gorge of the work, which is directed a little to the north of the site of Fort Sidi Ben Nour, is closed by a wall 10 or 12 feet high at the south-east corner, diminishing to 6 feet in height towards the north-east corner; this wall is separated from the hill slope in rear by a narrow low ditch, about 15 feet wide, the bottom of which is on a level with the road; it is flanked by a caponier, loopholed for musketry at the south-east corner close to the entrance gate. Above the gate are half-a-dozen loopholes firing up the road, which leads into the battery from the Vallée des Consuls. From this road footpaths lead round each flank of the battery, and descend the spur to the coast road.

The interior of the battery can be observed from the path which leads through the garden of the former British Consulate in a westerly direction towards the Pointe Pescade. It is commanded by the heights Sidi Ben Nour, —Vigie (or observatory)—Semaphore.

The telegraph, and apparently telephone wires (three wires in all), enter the battery from the direction of the Petit Seminaire on the south-east.

Batterie de Sidi Ben Nour. (*See* Pl. VA.)

Armament, 4—24-cm. B.L. guns. General direction of fire N.E.

This battery, facing north-east, was under construction in May 1889, on the eastern spur of the hill crowned by the observatory. About 100 disciplinaires were encamped in the neighbourhood, and employed on the work. The site, which is 870 feet above the sea, was being levelled, the earthwork was begun, and the Marabout* was being pulled down to be rebuilt on the slopes in rear. By November it was nearly complete, though there were still some 150 disciplinaires engaged on it.

It is believed to be a four-gun battery, though only three guns could be seen in November, the emplacements on the right being hidden by some trees and by the Marabout still standing. The left flank gun should command the Fortin de l'Ouest.

The left emplacement is 5 feet to 10 feet higher than the right, and the ground falls sharply to the right rear, causing the buildings, &c., situated in this part to be well sheltered. The fall to the front is very abrupt—quite one in three, while that to the right is about 10 degrees.

The guns appear to be 24-cm. in calibre, and the gun portions are of the usual type. At present the Marabout forms a high traverse between the left and right half battery, but it will no doubt be removed, as well as some trees growing in the middle of the battery.

At C there is a traverse or traverses, probably containing the magazine. The wall EF is quite unfinished. That from K by H to G is 12 feet high, with loopholes. At M there is a gate nearly complete. The barrack B is roofed and apparently complete, the loopholed wall being outside of it.

The battery can be approached by a carriage road leading from Bouzarea village to the Vigie Observatory. Thence a newly constructed road leads down the south slope of the east spur to the site of the battery, and a rough road runs along in rear of the battery to the village of Bab El Oued. From this road a good view is obtained of the work.

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* A Mohammedan Saint's tomb forming, in this case, a prominent white building.

The site, though very commanding, is overlooked by the neighbouring observatory hill, and the semaphore station beyond.

COMMUNICATIONS.

(*See* Pl. I. and II.)

Roads. Within the enceinte there are numerous roads connecting the batteries, concealed by trees and buildings from the sea.

With regard to the two most important works east of the town, communication can be maintained at a distance from the sea with the "Batterie des Arcades" by roads from the upper part of the town at the Porte du Sahel, through El Biar, La Colonne Voirol, and the Bois de Boulogne. This battery can also be reached by roads nearer the sea from the Porte d'Isly and Passage de Constantine through Mustafa Superieur and the Bois de Boulogne, or through Mustafa Inferieur direct to Les Arcades, as well as by the coast roads to the Jardin d'Essai.

The other important fort east of the town, namely, the Fortin des Temendfous, is very isolated. A good road leads up to it from Maison Carrée, which is in communication with Algiers by road and railway along the seashore. The road near the fort is much exposed to enfilade fire from the sea to the northward, though the form of the ground prevents its being seen. About 4,000 yards from the fort it crosses the Hamiz stream, a mile from its mouth, by an iron-girder bridge, about 80 yards long, on masonry piers. The stream forms an important obstacle with muddy bottom. Should this bridge be destroyed, communication with the fort could be maintained by means of the road to Aine Taya, the village on the seashore east of the fort, across a bridge higher up the Hamiz stream. When once the Hamiz stream is crossed, there is nothing between it and the fort to prevent Infantry moving across country, but the country is cultivated, and would be heavy after rain.

Of the two important works west of the town, that at Sidi Ben Nour can be approached by the circuitous inland carriage road from the Porte du Sahel by El Biar and Bouzarea. There is also a direct path up the hill from the suburb of Bab El Oued.

The Fortin de l'Ouest is connected with the town by a carriage road from the Porte Bab El Oued, through the suburb of Bab El Oued, and the Vallée des Consuls. A path also connects it with the coast road.

The coast road, through St. Eugène, is the only direct means of road communication with Pointe Pescade; but an inland road connects Algiers through El Biar and Cheraga with Guyotville, whence Pointe Pescade may be reached by the coast road from the opposite direction.

Telegraphs. The modern coast batteries are all connected by telegraph, and in some cases it would seem that telephone communication has been established.

Telegraphic communication with Temendfous Fort, and the semaphore at Cape Matifou, is maintained by sea-cable across the bay to the masonry blockhouse at the Quarantine Station, and thence by a land line.

Semaphores and lookout stations. Close to Temendfous Fort is, as has been mentioned, the new semaphore station, which communicates directly with the Bouzarea station, recently erected, near La Vigie. Both are in telegraphic communication with Algiers.* The Matifou semaphore was not in working order in May 1889. That at Bouzarea had just commenced working.

In addition to these means of observation, the coastguard detachments at Pointe Pescade, Fort des Anglais, Fort de l'Eau, and Fort Matifou, consisting of an Officer and six men, carefully watch the coast line. At the points named there is always a lookout man on duty, besides one on patrol. There is also a lookout man at the lighthouse, on the Ilot de la Marine in Algiers Harbour.

It would therefore be difficult for a vessel to approach Algiers by day unobserved.

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* *See* description of the one at Cape Carbon near Bougie.

MISCELLANEOUS INFORMATION.

Powder Magazines.

(*See* Pl. II.)

Besides the powder magazine outside of the town in the Frais Vallon Valley, there are four inside the town, viz.:—

(1.) Close to the Porte du Sahel.

(2.) On the spur below and east of the Porte du Sahel.

(3.) At the corner where the Rue Rovigo joins the road from the Kasbah to the Porte du Sahel.

(4.) Near the enceinte above and west of the Jardin Marengo.

Cartridge Factory.

The cartridge factory at the Salle d'Artifice turns out, it is stated, 30,000 cartridges a-day.

Coal Supplies.

Most of the coal at Algiers, the property of the British India Steamship Company's agent, is stored on Alefna Island and in hulks. It does not exceed 10,000 tons in store at one time.

The Government have a small supply at the south end of the Ilot de la Marine, about 2,000 tons.

Torpedo Workshop.

The "Atelier des Torpilleurs" is also on the "Ilot de la Marine," in the yard facing the inner harbour.

No torpedo boats however were to be seen in May 1889.

DELLYS.

JULY 1889. (*See* Pl. VI.)

Modern Coast Battery:—

I.—*Batterie du Bastion* 8 (*classed* 27*th May* 1889).

Obsolete works:—

Batterie du Sud .. .. } Declassed 27th May 1889.
Batterie du Cap Bengut .. }

I.—*Batterie du Bastion*, 8.

This is quite a new work, unarmed and still in process of construction. It is situated on the ridge of the hill behind the town, within and close to the enceinte wall due west of the usual landing place. It is close to and north of the small masonry blockhouse, shown on the Admiralty chart as a "signal-house," and about 350 feet above the sea.

The battery is in three sections. The upper section, next the blockhouse, has two emplacements for guns to fire north-west towards Cape Bengut and the bay, between it and Dellys Point. The enceinte wall of the town has been cut down at this point to admit of the guns firing in the required direction.

Further north, along the wall, is another section of the battery with two emplacements for guns to fire north-east, towards Dellys Point and on either side of it.

On the east flank of these emplacements is the third section for one gun to fire east directly on the anchorage.

The arrangements as to height of parapet, shell recesses and platforms are similar to those at the "Batterie du Coudiat El Snad," at Collo, and it seems probable that the battery is intended for 95-mm. B.L. guns.

The earthen epaulements are thick, and as the terrepleins have been cut out of the hill top, and are at different levels, the gun emplacements are fairly well protected from enfilade fire.

The battery, which is not at present enclosed on the town side, is overlooked to some extent from the higher part of the ridge, at the south-west corner of the enceinte, 300 yards distant.

It is entered by a new short road leading from the gate, by which a road quits the town 100 yards south of the "Signal-House." This road, on which are situated the municipal waterworks, ascends by zigzags from the landing place, past the Infantry barrack on the south side of the town.

OBSOLETE WORKS, &c.

Of the obsolete works, the "Batterie du Sud" is on the seashore, about a quarter of a mile from the south gate of the town. It is an unarmed earthen battery, about 20 feet above the sea, firing on the anchorage, and could be utilized by Infantry to oppose a landing. It is, however, overlooked by the higher ground in rear.

The "Batterie du Cap Bengut" was not visited. It is probably similar to the "Batterie du Sud" on the low-lying ground at Cape Bengut.

Powder magazine. The powder magazine is close to and within the enceinte at the south of the town, between the gate on the seashore and the next gate higher up the hill. An excavation has been made in the low spur which lies between the two gates, and the magazine is built in the excavation and isolated. It is fairly well sheltered, but not entirely concealed from seaward.

Arsenal. Between the magazine and the landing place on the seafront of the town is a small enclosure with buildings forming the Arsenal.

Eight M.L. guns, apparently 16-cm., with half-dozen lighter M.L. guns, apparently the old "canons de 8," were lying in the enclosure with their wooden carriages. These guns are probably those of the dismantled batteries. No new armament could be seen.

BOUGIE.

MAY—JULY 1889. (*See* Pl. VII.)

The modern coast defences of Bougie are, as classed by the law of 15th January 1885—

I.—Batterie de l'Hôpital.
II.—Batterie du Phare de Bouak.
III.—Batterie de la Pointe de Bouak.
IV.—Batterie du Milieu de Bouak.
V.—Blockhaus de Bouak.
VI.—Batterie du Col de Bouak.
VII.—Batterie du Centre.

The obsolete works are the following:—

Batterie de la Casbah.
Batterie Intermédiaire.
Batterie du Cimitière Israélite.
Batterie de Sidi Yaya.

The three last mentioned were only classed as military posts by the law of 15th January 1885. Now, together with the older work at the Casbah, they have been declassed by the law of the 27th May 1889.

The modern works, with the exception of the "Batterie de l'Hôpital," are at a considerable elevation above the sea, north of the town, on the hill slope commanding the bay and anchorage.

I.—*Batterie de l'Hôpital.*

Armament, 2—27-cm. B.L. guns. General direction of fire E. This appears to be the name of the two-gun earthen battery close to and above the old Fort Abd El Kader, but just outside the walled enceinte. It lies below the road which leaves the town by a gate in the enceinte immediately above the fort.

The battery is armed with two heavy guns, apparently 27-cm. B.L. of rather an old pattern on traversing front pivot platforms. The carriages form an open framework of iron, and the recoil is checked by compressor plates.

The guns, which are separated by a thick traverse containing the magazine, fire in an easterly direction, *en barbette*, at about 60 feet above the sea level.

The terreplein of the battery has been cut out of the side of the hill which closes the gorge. It is entered by a open communication through the enceinte wall of the town, and closed in front by an open paling.

The ground in front of the battery down to the seashore, though not forming a serious obstacle to assault, is broken and overgrown with bushes and trees. In rear the battery can be completely overlooked from the road already referred to.

II.—*Batterie du Phare de Bouak.*

This is quite a new battery, about 100 yards inland, west of the lighthouse, on Pointe Bouak, nearly a mile north-east of the port, and about 380 feet above the sea.

A detachment of about 100 disciplinaires were employed in finishing the earthwork in May 1889. The two emplacements are cut in the rock, at about 50 yards apart, and connected by a road in rear. The easterly or outer emplacement is a few feet higher than the other, and the intervening rock acts as a traverse to the inner gun.

The guns are not yet mounted, but will probably consist of 19-cm. or 24-cm. B.L. guns.

The direction of fire is north-east.

The expense magazine for each gun emplacement is cut out of the rock on the flank. The gorge is quite open, and the battery could be taken in reverse from the south-west off Bougie Harbour. Though the position of the battery on the chart would appear to favour an attack by enfilade fire, the form of the ground, and the advantage which has been taken of it, make the success of such an attempt unlikely.

The ground in rear and to seaward of the battery rises very steeply from the seashore. The slopes are covered with bushes and trees. In front of the battery there is a precipitous cliff.

The regular approach is by a branch road lately repaired and widened from the road, leading from Bougie to Cape Carbon.

The battery is of course overlooked, to some extent, by the high ground near this road.

III.—*Batterie de la Pointe de Bouak.*

This battery, which was not visited, is apparently that which can be seen from the sea east, or to seaward of the lighthouse on Point Bouak.

It is at the end of the promontory, and about 50 feet below the level of the lighthouse. The direction of fire is apparently east, and there is room for two guns, but none could be seen in position. The site is decidedly exposed to both direct and enfilade fire.

It is approached by the prolongation of the road which passes No. II. Battery and the lighthouse.

IV.—*Batterie du Milieu de Bouak.*

Armament, 2—24-cm. B.L. guns. General direction of fire S.S.E.

This battery is close to and below, or east of the Blockhaus de Bouak. The emplacements have been cut out of the rock, which also forms the traverse between them.

It is armed with two 24-cm. guns of recent pattern,* on traversing platforms (central pivot), firing *en barbette* in a south-south-easterly direction, at a height of 410 feet above the sea. The left gun, however, could be trained to bear on the sea to the north of the Bouak promontory.

The battery is entered in front by a branch road from that leading to the

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* Apparently the same as in the Batterie du Col de Bouak.

Bouak Lighthouse; though well concealed by trees, it is, to some extent, overlooked by the blockhouse in rear, and by the high ground further up the ridge.

V.—*Blockhaus de Bouak.*

This is a solid masonry two-storied blockhouse, apparently unoccupied. It is rather a prominent object, and could be destroyed by fire from seaward. It would, however, be difficult to capture the blockhouse without Artillery. The walls are defended at the base by fire from masonry machicoulis galleries.

VI.—*Batterie du Col de Bouak.*

Armament, 2—24-cm. B.L. guns. General direction of fire S.S.E.

This is an earthen battery between 300 and 400 yards west of the blockhouse, and higher up the ridge about 500 feet above the sea, where the road from Bougie to Cape Carbon crosses the Col.

It is armed with two 24-cm. B.L. guns, M. 1876, mounted on traversing (central pivot) platforms, and firing *en barbette.*

The weight of the platform is marked 7,890 kilogrammes, and of the carriage 6,700 kilogrammes, which are those given in the official handbook for the gun.

The general direction of fire is south-south-east.

The battery is enclosed by an open paling, and the emplacements are separated by a thick traverse, containing the magazine and telegraph instruments.

It is approached by the road already mentioned, which passes along the front of the battery. The country round the site of the battery is overgrown with bushes and trees. There is no serious obstacle to assault.

The battery is commanded by the rising ground in rear.

VII.—*Batterie du Centre.*

This earthen battery is also close to and west of the road from Bougie to the Cape Carbon Lighthouse, about 350 feet above the sea, and 500 yards from the enceinte at the north-east corner of the French cemetery. Its position is marked by the Cypress trees at this point of the cemetery.

It has emplacements for two guns with a thick traverse between them, into which the telegraph wire leads. Though not of very recent construction, the battery is in good order, and ready for armament. The general direction of fire is south-east.

The gorge is open and the battery is surrounded by an open paling, offering no serious obstacle to assault. It is entered from the main road by a gate in the north side of the battery. The hill slope on which it stands, and from which in rear it is to some extent overlooked, is covered with bushes and trees, which partly conceal it.

OBSOLETE WORKS, &c.

Obsolete works.

Of the obsolete works at Bougie, the "Batterie de la Casbah" is situated on the ancient, but well-preserved masonry citadel to the south of the town. The "Batterie Intermédiaire" was not identified. The "Batterie du Cimitière Israélite" is an earthen battery on a small spur below the French cemetery, and about 200 feet above the sea. There are emplacements for two guns, to fire south-east, separated by a traverse, but there seems to be no intention of utilizing them, and the battery is apparently falling into decay. The "Batterie de Sidi Yaya," is an unarmed two-gun battery, similar to the above, and about 30 feet above the sea nearly 1,000 yards north of the town at the Sidi Yaya Bay.

Communication.

Communication is established by telegraph between the town and the modern batteries, and they are approached by the road to the Cape Carbon Lighthouse, which leaves the town by a gate in the loopholed enceinte wall above the barracks (marked "Hospital" in the Admiralty chart, No. 1766). This road which is in good repair as far as the Batterie du Col de Bouak

(No. VI.), leads past the entrance to and along the lower wall of the French cemetery, gradually ascending the hill slope.

Below the barracks another road leads out of the town by a gate, and passes just above the Batterie de l'Hôpital (No. I.). This road bifurcates shortly after it leaves the town, one branch ascending the hill past the old Batterie du Cimitière Israélite, to join the upper road near the entrance to the French cemetery; the other branch descending to the sea shore at Sidi Yaya Bay, passing the old Batterie de Sidi Yaya.

A third road leaves the town below the old Fort Abd El Kader, and skirts the seashore as far as Sidi Yaya Bay.

At the point where the French cemetery ends, the Cape Carbon road passes the Batterie du Centre (No. VII.) on the left, and just before arriving at the Batterie du Col de Bouak, a branch road leads to Pointe Bouak Lighthouse, passing near the site of the Bouak Blockhouse with its battery, to which a short road gives access, and close beside the new Batterie du Phare de Bouak.

From the Batterie du Col de Bouak to the Carbon Lighthouse, the road is only a mule track, though it has been traversed once or twice by a carriage.

All the roads are, of course, from the nature of the ground, exposed to fire from the sea.

Semaphore at Cape Carbon. (*See* inset plan and elevation on Pl. VII.)

The semaphore station, which is in telegraphic communition with Bougie, is built close to the lighthouse on the top of the isolated rock, which rises precipitously 730 feet above the sea. It has been nearly a year in course of construction, and is now almost completed.

As all the semaphore stations recently erected along the Algerian coast appear to be similar in design, a few notes from personal observation on the arrangements adopted in this case may be here recorded, especially as strangers are not usually admitted to these buildings. The signalling apparatus consists of two sets of arms on a strong iron post, which is supported on a large frame work, the base of which rests on a circular plate provided with rollers, so that the whole apparatus may be moved horizontally round the centre pivot. The arms are moved by levers and rods attached to the centre post.

In order to enclose the frame work and levers, a masonry tower is built, and this is in connection with the dwelling rooms and telegraph and other offices, which are built round a small courtyard. A staircase near the tower leads to the roof of the dwelling rooms. This is provided with a low parapet, at the outer corners of which are loopholes for musketry fire.

On the roof is a flagstaff for signalling purposes.

The design of the buildings has been adapted to prevent capture by a *coup de main.*

The view from Cape Carbon, in both directions, along the coast is very extensive, and the situation of the semaphore station is also locally favourable from a defensive point of view, owing to the difficulty of landing and the natural obstacles of the approaches.

The best position at sea from which to destroy the semaphore by shell fire, is to the northward, keeping clear of the field of fire of the guns in the new battery at Bouak Lighthouse.

Water supply to the town.

A masonry water conduit leads from a spring in the hill side, between Bouak Point and Cape Carbon, along the line of the road from the lighthouse to the town.

Arsenal.

The arsenal at Bougie is at the Casbah. A few old S.B. ordnance were in May 1889 lying outside on the esplanade, and six new overbank carriages, apparently for the 95-mm. B.L. guns.

On the mole near Fort Abd El Kader were four heavy guns, apparently 19-cm., about 13 feet long, of recent pattern, and their carriages, with hydro-pneumatic recoil arrangements for traversing platforms. These were being taken up to the arsenal in June 1889, and are probably intended to arm the batteries on the hill (? "du Centre" and "du Phare de Bouak").

Railway.

Bougie is now connected by railway with Beni-Mansour on the East Algerian Line.

DJIDJELLI.

May—July 1889. (*See* Pl. VIII.)

The modern coast defences of Djidjelli are—

I.—Batterie du Fort Duquesne.

II.—Batterie du Rocher Picouleau (classed 15th January 1885).

The obsolete works are—

Batterie de l'Hôpital (declassed 15th January 1885).

Batterie du Phare (declassed 15th January 1885).

There is no very high ground in the neighbourhood of the town and, as the armament of the batteries is not powerful, the defences of the anchorage and town are not important. There are no recently erected works.

I.—*Batterie du Fort Duquesne.*

Armament, 1—16-cm. B.L. gun, 1—22-cm. S.B. mortar. General direction of fire N.E.

This earthen battery is on the top, and on the sea front, of the old masonry fort on the shore at the south end of the town.

There are two emplacements separated by a traverse. In the south emplacement there is mounted on a traversing platform one B.L. gun, apparently 16-cm. calibre. In the north emplacement is a S.B. mortar, apparently 22-cm.

The general direction of fire is north-east, towards the anchorage, and the emplacements are about 60 feet above the sea.

The fort itself is in good preservation, but the masonry is completely exposed to fire from the sea. The entrance is through a gate in the curtain of a small bastioned front, which closes the gorge. It would be difficult to enter the work without forming a breach.

A small garrison is quartered in the fort.

II.—*Batterie du Rocher Picouleau.*

Armament, 1—16-cm. B.L. gun, 1—22-cm. S.B. mortar. General direction of fire N.

This battery is cut out on the reverse slope and near the top of a rock north of the town, and about 300 yards west of the citadel, and less than 100 yards from the seashore. There is a cemetery on its left front.

There are two emplacements separated by a traverse, containing the magazine and telegraph instruments.

The emplacements are armed similarly to those in the Fort Duquesne battery, *i.e.*, the east emplacement with a 16-cm. B.L. gun, and the west emplacement with a 22-cm. S.B. mortar.

The height of the battery is about 60 feet above the sea, and the general direction of fire is north.

The battery is open in rear and the hill behind is scarped to the road, which leads from the town along the western seacoast.

It would be easy for a landing party to obtain possession of the battery and disable the armament.

Obsolete Works, &c.

Of the obsolete works, the Batterie de l'Hôpital appears to be that on the sea front of the citadel. The citadel is in good repair and contains military buildings, including the hospital. Admission, however, is prevented by a guard at the entrance.

As far as could be seen from the sea there are no guns mounted and the ramparts seem out of repair.

At the lighthouse no armament could be seen and any battery that existed there seems to have now been demolished.

Communications.

The communications by road through the town are good. The batteries are also connected by telegraph.

What is marked as a semaphore on the Admiralty chart exists as a small tower on the rising ground north-west of the town, but it does not seem in use as a semaphore.

Harbour. The harbour is still in the insecure state noted in the Admiralty Report, the construction of a breakwater having been apparently abandoned.

COLLO.

JULY 1889. (*See* Pl. VIII.)

I.—*Batterie du Coudiat El Snad* (*classed 27th May* 1889).

Collo is defended by a new earthen battery on the extremity of a spur overlooking the port, 300 yards south-west of the landing place. The battery was not armed at the beginning of July 1889, but the earthwork was nearly completed. The terreplein was cut out of the ground, and there were emplacements for two guns without any traverse. From the height of the exterior revetment and general arrangements (small shell recesses, &c.), it is probable that the armament will be two 95-mm. B.L. guns on overbank carriages.

The battery is about 350 feet above the sea, and fires east, covering the anchorage and landing place. It is probable that light guns like these could be also used to fire in the direction of the Jeunes Filles Bay, on the west of the El Djerda Peninsula. The site of the battery is approached by a newly made road, which ascends from the coast road beyond Cape Seneda,* and after crossing a col, winds round the north side of the spur above the town of Collo.

The position of the "Blockhaus du Coudiat El Snad," which has also been classed as a military post by law of 27th May 1889, was not identified.

PHILIPPEVILLE.

MAY—JULY 1889. (*See* Pl. IX.)

The modern coast defences of Philippeville are—

I.—Batterie de Skida, } (classed by the law of 15th
II.—Batterie de Beni Melek, } January 1885).
III.—Batterie d'El Kantara (classed by the law of 27th May 1889).

These batteries are situated on the heights which bound the Stora anchorage, and the new port of Philippeville on the south-west side.

In addition to these, there are the following obsolete works:—

Batterie du Fort d'Orleans (classed by law of 15th January 1885; declassed by law of 27th May 1889).
Batterie No. 3 d'El Kantara, } (declassed by law of 15th January
Batterie de l'Ilot des Singes, } 1885).

I.—*Batterie de Skida.* (*See* Pl. X.)

Armament, 4—27-cm. B.L. guns. Direction of fire N.N.W.

This powerful earthern battery has been constructed within the enceinte on the top of the Skida hill, east of the town, and about 530 feet above the sea.

The earthwork has been reconstructed, and the battery has been recently armed with four heavy B.L. guns (apparently 27-cm.) in two groups, about 50 yards apart, connected by a tunnel in the intervening rock. Each pair of guns is separated by a thick traverse. The general direction of fire is north-north-west, directly defending the harbour and its approaches, as well as the Stora anchorage.

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* *See* Admiralty chart, which, however, is inaccurate as regards the details on land.

The gorge is closed by an open paling which surrounds the whole battery. The face of the hill, which rises from the harbour in front of the battery, is precipitous and inaccessible. In rear of the battery the hill slopes enclose a well-sheltered valley, where are a powder magazine and several detached buildings, apparently used as military storehouses.

The approach to the battery from the eastward is prevented by the self-flanking enceinte wall of the town from 12 to 14 feet high. In this wall is a gate about 50 yards in rear of the battery by which a cart track enters the town from the country. The battery can be approached from the town by a new road, which ascends the western slope of the hill in zigzags to the gate before mentioned. Between the gate and the battery is a guardhouse and lookout, where a sentry is stationed.

The battery is neither commanded nor overlooked by the neighbouring ground, though the hill top west of the town, occupied by the land Fort National, is nearly on the same level.

It would, therefore, be very difficult to capture this battery; and owing to its height and general design, it would be almost impossible to silence its guns by fire from the sea.

II.—*Batterie de Beni Melek.*

Probable armament, 2 B.L. guns (?) 19-cm., 2 light B.L. guns (?) 95-mm. Direction of fire N.N.E.

This battery is west of the enceinte, on a hill which rises west of the outlet of the Beni Melek valley, above the end of the western breakwater. It is about 300 yards inland, and 350 feet above the sea.

No heavy guns could be seen in position, but practice had been going on from light guns in this battery. The general direction of fire is north-north-east. The earthwork has been recently strengthened, and a plantation of young trees in front, to some extent, conceals the battery from the sea. There are emplacements for two heavy guns, separated by a thick traverse, containing the magazine and telegraph instrument. There is room alongside of the east gun emplacement for two light guns, say 95-mm. B.L., which would be very suitable in this position, with respect to the harbour mouth. These light guns are apparently already in place. The battery is enclosed by a hedge in front, and open paling in rear.

The slopes of the hill in front, and on the right flank and rear are fairly open, and, though steep, not by any means precipitous.

It is approached in rear by a zigzag military road from the Abattoir on the seashore, at the embouchure of the Beni Melek valley. A branch cart track turns off, before the site of the battery is reached, into the neighbouring private properties on the hilly ground which overlooks the Philippeville—Stora coast road. A path leads down to this coast road through the wood near the west flank of the battery.

The battery is commanded, and, to some extent, overlooked by the higher ground, about $\frac{3}{4}$ of a mile to the south-east, at Fort National, as well as by the inland spurs bounding the Beni Melek valley, of which the hill occupied by the battery forms part on the west side.

An attempt to obtain possession temporarily of this battery would not be attended with so great difficulties, as in the case of the Skida Battery. The storming party would advance by the wood on the west flank, whilst the ships took up a position so as to enfilade the Beni Melek valley, and prevent reinforcements issuing from the town.

III.—*Batterie d'El Kantara.*

This battery is on the top of a spur on the east side of the Kantara valley, about 300 yards from the sea, and 480 feet above it. It is nearly a mile from the entrance of the harbour, and occupies the site of an old redoubt of the same name.

A new road, apparently for the conveyance of the armament, has been cut on the steep face of the hill in front of the battery; but it was not possible to determine where this road debouches. There appeared to be no access to it from the Philippeville—Stora coast road, from which alone the battery was observed. The map shows a path, in connection with the road from the Beni Melek valley, approaching the site of the battery from the rear along the crest of the spur. This might be followed by any future visitor to Philippeville.

As far as could be seen from the coast road, the Kantara Battery has emplacements for two guns, separated by a traverse. The general direction of fire is north-east.

The battery is only partially commanded by the higher part of the spur inland. It does not look as if the reconstruction of the battery has been taken in hand yet. The position, however, is a good one, flanking the approach to the harbour and the Stora anchorage.

Possibly two of the four guns (? 19-cm. B.L.) observed in the arsenal will be mounted here.

A small landing place, at the mouth of the Kantara stream, would be available for a landing party intended to capture the battery. The steepness of the slope up to the battery from the Kantara valley would also favour the attack, as the landing place and most of the slope cannot be seen from the battery.

Troops in the obsolete battery, however, near the landing place, would interfere seriously with such an adventure.

OBSOLETE WORKS, &c.

Obsolete works.

Of the obsolete works we have, first, within the town—

Batterie du Fort d'Orleans.

This is an earthwork on a spur near the north-west corner of the enceinte, about 220 feet above the sea, and close to the military hospital. The direction of fire is to the north. There are emplacements for two pair of mortars, separated by a traverse with magazine. One pair of S.B. mortars, apparently 22-cm., were still in position, but the battery appears to be in process of dismantlement, in accordance with the law of 27th May 1889. The gorge is open, and the battery is enclosed by an open fence. Its position is concealed by trees from the sea, and there are numerous buildings springing up round it.

Outside the town and near the Stora anchorage are the—

Batterie No. 3 d'El Kantara.
Batterie de l'Ilot des Singes.

The former is an unarmed lunette-shaped earthwork of weak profile, at the mouth of the Kantara ravine, on a small eminence 50 feet above the sea, east of the Stora Cemetery and of the Philippeville—Stora road. The gorge is closed by a small two-storied barrack of brick. The whole is out of repair and completely neglected. It could only be of use for the protection of Infantry opposing a landing on the Stora beach or at the Kantara ravine. The general direction of fire is north-north-west, and the faces of the lunette are each about 100 feet long.

The "Batterie de l'Ilot des Singes" is a closed unarmed masonry fort, a quarter of a mile north of the village of Stora, on the small rocky island about 100 yards in circumference, where the Stora Lighthouse is situated. It is semi-circular in trace, firing on the anchorage and partly on the beach to the south-west. There is a small barrack inside, but, except the lighthouse keeper, there is no one living in the fort, and it is evidently falling into disrepair. The masonry is completely exposed to fire from seaward, and the fort would be untenable under a bombardment. The island is connected with the mainland by a narrow masonry causeway 20 yards long.

It may here by mentioned for the sake of identification, that on the high hills round Stora are three small earthwork redoubts, visible from the sea. These are apparently ancient works intended rather for defence against the

Arabs than for the protection of the anchorage. There appears to be no carriage road communicating with them. They are not to be considered part of the coast defences of Philippeville.

Communications. A good carriage road leads along the coast from Philippeville to Stora, but it is almost completely exposed to fire from the sea. There is no convenient means of communication between the modern batteries by road inland.

The Skida and Beni Melek Batteries are connected by telegraph. But that at El Kantara does not yet appear to be in telegraphic communication.

Lookout stations. There is apparently no semaphore station near Philippeville for signalling the approach of ships. The only lookout appears to be that at the harbour entrance and possibly also on the Skida Hill.

Arsenal. The arsenal is in the town at the south-east corner of the square where the church stands. In addition to a few old S.B. ordnance, four heavy B.L. guns, apparently of 19-cm. were to be seen in the courtyard.

Powder magazine. A new powder magazine, bearing the date 1886, has been constructed on the top of the hill at the corner of Fort National, within and close to the enceinte at the back and south-south-west of the town, the magazine is chiefly underground, but the earth covering gives it the appearance from the sea of being a new battery.

A sentry is always on guard.

Water supply. The principal water supply for the town is stored in the ancient cisterns not far from, but below the powder magazine, near Fort National.

Harbour. The port is now completed, except that the height of the outer breakwater is being increased by an additional layer of heavy masonry blocks.

BONE.

May—July 1889. (*See* Pl. XI.)

The modern coast defences of Bone are all on the heights to the north of the town, on the west side of the Bay of Bone. They comprise—

I.—Batterie du Front, 31—32, } (classed by law of 15th January 1885).
II.—Batterie des Caroubiers, }
III.—Batterie du Fort Genois (classed by law of 27th May 1889).

The obsolete works have all been dismantled and disarmed, and could only be utilized in some cases for field troops to oppose a landing. They may be enumerated as follows:—

Batterie nord de la Casbah (classed 15th January 1885), }
Batterie haute du Lion, }
Batterie basse du Lion, } (declassed by law of 27th May 1889).
Réduit du Lion, }
Batterie de l'Anse des Corailleurs, }
Batterie du Mouillage du Fort Genois, }
Fort Genois, } (declassed 15th January 1885).
Batterie de la Pointe du Fort Genois, }

I.—*Batterie du Front*, 31—32. (*See* Pl. XII.)

Armament, 2—27-cm. B.L. guns, 2—95-mm. B.L. guns. Direction of fire E.S.E. This is a strong earthern battery of recent construction at about 120 feet above the sea, inside the north-east angle of the enceinte below the Casbah (or old citadel), and above the end of the outer northern breakwater. It is east of and close to the gate (Porte des Caroubiers), by which a high road leads from the town along the coast to the lighthouse at Cap de Garde. The general direction of fire is east-south-east, covering the entrance to the harbour and the approaches from the westward.

A thick traverse with magazine separates two heavy guns (apparently 27-cm. B.L.) mounted *en barbette* on traversing platforms.

The northern emplacement, which is a few feet higher than the terreplein of the battery, is protected from enfilade from the north by the earthen rampart of the enceinte, which has here been strengthened. Alongside of the southern heavy gun are two light B.L. guns (apparently 95-cm.) on overbank carriages.

The gorge of the battery is closed by a light open wood paling, and it is guarded by the sentry, who is mounted at the town gate.

Access to the battery from seaward is prevented by the bastioned wall of the enceinte, which at this point is in good order, and from 10 to 20 feet high, built at the top of the steep rocky slope which rises from the end of the northern breakwater.

The battery is commanded in rear by the hill, 360 feet high, on which the Casbah is built. Owing, however, to the high trees growing on the slopes, and to the form of the ground, it is probably not actually overlooked from the top of the hill.

II.—*Batterie des Caroubiers.* (*See* Pl. XIII.)

Armament, 3—24-cm. B.L. guns, 2—95-mm. B.L. guns. General direction of fire E.N.E.

This powerful battery, which has been recently reconstructed, is situated on a hill outside the enceinte, about half a mile north of the Casbah and 250 yards from the sea, at a height of about 230 feet. It is in course of armament. The general direction of fire is east-north-east. The work is closed in rear by a hedge, and is divided into two parts by a thick traverse (or parados), through which is a covered communication. In the northern half of the work two heavy B.L. guns (apparently 24-cm.) are mounted *en barbette* on traversing platforms. The guns are separated by a traverse. In the southern half one heavy B.L. gun (apparently 24-cm.) is mounted similarly to the other two; and alongside of this, ready for their guns, are two light overbank carriages of the type used with the 95-mm. B.L. guns. The entrance to the battery is near the south-west corner. This is connected by a short branch road with the main inland road, leading from the Porte des Caroubiers to the Baie des Corailleurs.

The battery is commanded, and to some extent overlooked by the high ground in its right rear towards the Casbah.

There is no ditch in front. The hill slope is open and not very steep, and there does not seem at present to be any serious physical obstacle to prevent a storming party entering the battery from the front, or from the rear.

The sandy beach north and south of the battery is favourable for a landing.

III.—*Batterie du Fort Genois.*

Probable armament, 4—27-cm. B.L. guns. Probable direction of fire S.E.

This battery is under construction, at about 150 feet above the sea, close to the cliff, on the site of the old Fort Genois, nearly 4 miles from the entrance to the Port of Bone. The old fort with the former lighthouse has been demolished. The light is at present shown from a high wooden erection. This seems also of use as a lookout for the military guard in charge of the convicts or "disciplinaires" employed in building the fort. The lighthouse will ultimately be rebuilt in a new position in the neighbourhood.

The site of the battery can be approached by the carriage road leading from Bone to the Cap de Garde Lighthouse. A sentry, however, is posted at the point where the branch road leads off, about 150 yards from the actual site of the battery, and no stranger is allowed to pass. This branch road enters the battery by a cutting, and it is connected where the sentry is posted by another new road with the seashore below, where probably arrangements have been made for landing the guns. These would appear to have already been landed, having been brought by sea from Bone. Four guns, 6 metres long, were reported to have been landed at Bone for Fort Genois. These would probably be 27-cm. B.L.*

The only point from which the battery can to some extent be overlooked is from the bend of the road from Bone, due west of the battery. From this point a gun carriage could be seen in place. The exact trace of the battery was very difficult to determine. The emplacements appeared to be cut out of the hill top, and in rear is a casemated parados for the accommodation of the garrison. The general direction of fire will probably be south-east, and the guns will be in two groups, of which the more easterly group will be at a somewhat lower level than the other.

It is impossible at present to tell what arrangements will be made for preventing access to the battery. No ditch has been begun.

The object of the battery is evidently, like that of the Temendfous Battery in the case of Algiers, to take in reverse any ships that might be bombarding the harbour and town of Bone, and to deny them the use of the anchorage of Fort Genois.

The design of the fort will probably make it difficult to silence the guns by reverse or enfilade fire. It will therefore depend on the nature of the obstacle on the land side whether the capture of the work by storm would be feasible. A landing is possible in the bays either north or south of the new battery; but this would be very difficult if a field force were available to man the old works, which command these landing places, namely, the old Batterie du Fort Genois to the north, and the Batterie du Mouillage on the south.

THE OBSOLETE WORKS, &c.

Such being the modern coast defences of Bone, it is necessary to describe briefly the obsolete works, partly for the sake of identifying them and partly because, till they are actually demolished, they may at any time be utilized by field troops if necessary.

Obsolete works near Fort Genois anchorage.

The oldest group of works is that round the Fort Genois anchorage. They were evidently built before the construction of the new port at Bone, and when the safest anchorage was at Fort Genois.

The group included, besides Fort Genois, which has been demolished—

(*a.*) The old Batterie du Fort Genois.

(*b.*) Batterie du Mouillage.

(*c.*) Batterie de l'Anse des Corailleurs.

(*d.*) Batterie de la Baie des Corailleurs.

The Old "Batterie du Fort Genois."

This is an earthen lunette-shaped work of slight profile, about 50 feet above the sea, facing north-east, and with the left face, about 100 feet long, commanding the sandy beach to the north of Fort Genois. It is unarmed.

Batterie du Mouillage.

This is also an unarmed earthwork at about the same level, on the point south-west of Fort Genois, covering the anchorage and the landing place to the north of the battery, *i.e.*, south of the fort. In rear of the earthwork, and in an excavation by which it is covered from view from the sea, is a masonry two storied blockhouse, or keep, acting as a reduit, and covering the landing place to the south-west.

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* A larger number (nine) was also mentioned by another informant as the probable armament. But, bearing in mind the principles on which coast batteries are at present constructed in France, it seems unlikely that more than four heavy guns will be mounted here; and there does not seem room for more. A couple of 95-mm. B.L. guns may possibly be added, but they are not so necessary in this position as in the other two coast batteries.

Batterie l'Anse des Corailleurs.

This is situated north of the Baie des Corailleurs, and is very similiar to the Batterie du Mouillage, the unarmed earthwork covering the anchorage and the sunken blockhouse the landing place.

This blockhouse is now used as a coastguard station, and a lookout man is always on duty here. The design of the blockhouses provides two tiers of loopholes, with ports on the upper storey for machine guns. The foot of the walls is defended by machicoulis galleries.

Batterie de la Baie des Corailleurs.

This is a small redan-shaped earthwork facing east, and firing on the anchorage in the bay. It is unarmed.

Obsolete works near Lion Point.

The other group of obsolete works lies outside the enceinte, between it and the Batterie des Caroubiers. It comprises the Batterie Nord de la Casbah and the group of works near Lion Point.

Batterie Nord de la Casbah.

The "Batterie Nord de la Casbah" is an earthwork on the spur which descends from the Casbah towards the Batterie des Caroubiers. It lies 200 yards north of the Casbah and about 250 feet above the sea. It was apparently armed with mortars or howitzers, but these have been removed. The general direction of fire is east. There are two emplacements, separated by a traverse, with magazine. The battery is open in rear, but surrounded by an open paling.

"Batteries haute et basse" and the "Réduit du Lion."

The Batterie basse du Lion is an unarmed earthwork on the seashore at the Lion Point. It is closed in rear by the Réduit du Lion, a masonry loopholed enclosure, the wall of which is about 10 feet high at the gorge.

This work is overlooked by the small eminence in rear, about 40 feet high, on which stands a ruined lighthouse. On the north-east slope of this eminence and about 50 yards from the reduit, lies the Batterie haute du Lion. This unarmed work is very like the Batterie nord de la Casbah, and consists of two emplacements, separated by a traverse, and facing east-north-east.

Observation of the coastline.

The principal lookout station is at the new semaphore at the Cap de Garde. This has been recently built on the top of the hill Mount Sidi Nour, about 400 yards south-west of the lighthouse and 518 feet above the sea. The position is a most commanding one, and, owing to the rocky coastline to the north and west, it is not easily accessible to a landing party, except to the eastward, by the bay north of Fort Genois. The building is fairly defensible against rifle fire only. The design appears to be identical with that of the other new semaphore stations along the coast. A detailed description of that at Cape Carbon is given in connection with the defences of Bougie.

The Cap de Garde semaphore has just been connected by aerial telegraph line with Bone, and it will very shortly be in working order.

The landing places between Cap de Garde and Bone are watched by the coastguard, who have their head-quarters, as has been already stated, at the Batterie de l'Anse des Corailleurs, where a lookout man is always on duty.

The Casbah also offers a good post of observation, but it is difficult to say if it is so used, as admittance is refused to strangers.

Communications.

The coast carriage road connecting Bone with the lighthouse at Cap de Garde serves as a means of communication between the various coast batteries. It is in good order, but, of course, much exposed to seaward. From Bone, as far as the Baie des Corailleurs, the coast road is supplemented by two additional carriage roads hidden by low hills from the sea. Beyond the Baie des Corailleurs, the coast road is the only one available.

The three coast batteries are connected by aerial telegraph with the headquarters in Bone. Telephone communication does not yet exist.

Harbour works. Improvements are being carried out in the outer harbour apparently with the object of making it more convenient for shipping. Owing to the high ground which comes close to the west shore, the approach from the heart of the town is at present circuitous. This defect is being remedied by a new direct communication, which is being made by a deep cutting leading from the Cathedral of St. Augustine to the centre of the west shore of the outer harbour. Part of the harbour on this side is being reclaimed to form commodious quays, and the rest is apparently being deepened.

Torpedo boats and coal. No torpedo boats were to be seen in either harbour, nor do any arrangements appear yet to have been made for their reception.

Only a small stock of coal (patent fuel) could be seen. This was on the new quays of the outer harbour.

BIZERTA.

MAY—JULY 1889. (*See* Pl. XIV.)

Coast defences. As far as could be seen, no modern coast batteries are in existence, or under construction at Bizerta. With the exception of the hill to the north-west, and close to the town, the high ground is at a considerable distance from the shore on either side of the bay, and there are but few elevated sites on which batteries could be conveniently built. At Cape Guardia, however (4½ miles from Bizerta), and Cape Zebib, the high ground approaches close to the shore, and it was stated by the French Superintendent of Lighthouses in Tunis that on both these sites coast batteries were eventually to be erected.* The position at Cape Zebib, which was visited in May 1889 is, though at a considerable distance (10 miles) from the town of Bizerta, favourable for guns to take in reverse hostile ships in the roadstead, like that at Cape Matifou with respect to Algiers, and it may be observed that the projected new entrance into the lake will be half a mile nearer Cape Zebib than the present one. It is said that, owing to the appropriation of the site for a battery, no lighthouse is to be erected at this point of the coast line.

All the old masonry Tunisian sea forts have been dismantled, and the guns either removed or dismounted. These guns are old S.B. 30-prs. or 40-prs. The wall forming the enceinte of the town is intact, and forms an obstacle of considerable importance, as regards attack by a force unprovided with Artillery. It is in most places from 20 to 30 feet high, and provided near the top with loopholes for musketry fire from an elevated banquette. The small flanking masonry bastions have ports which could be utilized for machine guns, or light field guns.

The citadel does not appear to have any guns mounted to command the town, but at the highest and most northerly point within the enceinte at the entrance to the Fort des Espagnols, the French have thrown up a siege battery of earth, revetted with barrels, and armed with three B.L. field guns, apparently 90-mm., and one B.L. 12-cm. gun on overbank carriage.

This battery, which is well concealed, fires in a south-easterly direction, and completely commands the town, and the entrance at the bridge into the lake.

It is hidden from seaward by the wall of the enceinte, but it should not be difficult to dismount the guns by high-angle or curved fire.

A detachment of Artillery is quartered in the Fort des Espagnols.

Barracks. The barracks consist of about a dozen small masonry huts of recent construction, with tiled roofs, grouped on a hill 400 yards outside the enceinte and west of the town. These were not visited, but they must be, for the most part, now unoccupied, as the garrison is reduced to one company of Fortress Artillery.

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* This is in confirmation of what Mr. Ricketts reports in his despatch, No. 12, of 25th February last, in which, however, he speaks of Cape Zebib as Jebel Kabir.

Commercial Harbour works.

In May and June 1889, the dredger and three lighters were drawn up on the shore of the lake just inside of the bridge, connecting the island in the town with the south shore of the lake. Here they were being painted and overhauled.

The bridge, which is about 100 feet long, is of masonry, but, as has been previously reported, the three centre arches have been removed, and replaced by a wooden structure, the roadway of which is about 15 feet above the water.

The centre portion of the roadway can be lifted by pulleys and chains to a further height of about 8 feet, so as to allow small craft to enter the lake.

The strong current flowing under the bridge makes it difficult to determine the depth to which the canal from the sea has been deepened; 10 feet, however, would seem to be a fair estimate of the present depth in the centre.

The sea entrance to the canal is protected by a breakwater on the north side extending for about 120 yards from the Casbah seaward. This breakwater is at present being lengthened in a slight curve to the south about 150 yards further, so as to reach the 3-fathom line. It is constructed of large blocks of stone about 5 feet square, dropped into the sea by means of a floating double raft fitted with lowering gear. A few of these blocks are on the quays, having been evidently brought by sea from a distance. But for the future the stone will be obtained from hills about 2½ miles distant to the north of the town. For this purpose, a light Decauville railway is being laid along the sea shore in front of the Casbah.

The earthwork for the railway was completed for half the distance, and one locomotive and a few trucks had just arrived at the end of June 1889. The railway ends on the quay at the corner of the Casbah, where a wooden stage and strong pair of sheers have been erected, so as to drop the stone blocks on to the raft for conveyance to their destination. Between 100 and 200 men were at work on the railway, which should shortly be completed.

The contract for the harbour work is in the hands of a French syndicate, consisting of MM. Hersent, Lesueur, and another. MM. Hersent are well known as Marine Engineers. They have constructed many great harbours (Saigon, Odessa, &c.), and are now at work at Lisbon. Their connection with the Bizerta harbour works should be a guarantee of the work being solidly done.

When the breakwater is completed, it will, it is said, be possible for the Transatlantique steamers, which now call regularly at Bizerta, to come alongside in calm weather. Further, should the existing entrance to the lake be deepened sufficiently, it will be possible for these steamers, which are under 2,000 tons' register, to enter the lake.

The projected military port.

To utilize the lake, however, as a military port, it would be best to cut a new entrance. The line of this cutting has been recently surveyed by French engineers, and it is marked by staffs solidly imbedded in masonry, and running approximately as marked on the chart across the spit, and well into the lake. The site of one of these staffs about 600 yards from the Tunis gate of the town was visited. Here the sand spit separating the lake from the sea is narrowest, and at the highest point only a few feet above the level of the sea. It would certainly be easy to cut a new canal at this spot.

But the expense of making the military port depends also on other conditions. A glance at the chart will show that, besides the actual cutting, dredging is required over a distance of more than 1½ miles before ships of heavy draught could pass into the lake Further, in designing the works, account has to be taken of the possible silting up of the sea entrance to the new canal, owing to storms and local currents. To obviate this, it may be necessary to extend still further the existing breakwater. It may be partly in view of this contingency that the elaborate railway arrangements are being made for the provision of adequate supplies of stone. These are questions which an experienced marine engineer like M. Hersent should be able to solve.

His son was at Bizerta about the middle of June 1889, and carefully examined the projected site and the whole of the neighbourhood. His foreman on the works stated distinctly that 62,000,000 francs (2½ millions sterling) were to be spent on the military port, to be paid for by the Government of Tunis. This confirmed a report which had reached the British Consul at Tunis (Mr. Ricketts), that about 50,000,000 francs were to be spent from Tunisian revenues on the military port of Bizerta. The authority for this statement was said to be Mr. Cambiaggio, the agent for the Transatlantique Company at Goletta, and though Mr. Ricketts did not feel justified in officially reporting the rumour in a despatch, he mentioned it for what it might be worth.

M. Hersent's foreman at Bizerta also stated* that his employer and the syndicate associated with him were actually charged with the execution of the new works, and he expressed his conviction that these would be commenced at an early date—probably during the ensuing winter.

It may also be noticed in this connection that the Committee of the Chamber, which reported on the Naval Budget for 1889, drew attention to the value of Bizerta as a military port and the necessity of taking more advantage of it.

Torpedo boat station.

There was only one torpedo boat, No. 37, at Bizerta. This, in May 1889, had entered the lake, and was reported to be engaged in surveying and taking soundings in the lake. At the end of June it was being painted in the small floating dock just inside of the town bridge near the dredger.

The dock is only large enough for small vessels like the torpedo boat.

On the other side of and close to the bridge near the quay, at the Tunis gate, a small vessel, named the "Guepe," apparently an old gunboat, is moored and used as a torpedo workshop. Four fish torpedoes were counted in store on board. There did not appear to be room for many more, but the exact number could not be verified, as strangers are prohibited from going on board.

Coal supply.

No coal stores were seen on shore, but there was a small supply in a lighter.

Water supply.

A new water supply is being provided for the town, and the iron pipes were being laid in the streets.

Commerce.

There appeared to be very little trade going on. There are scarcely half a dozen small boats altogether at Bizerta, and no vessels, besides the mail steamer, were lying in the roadstead.

Communications.

A good metalled road, with a telegraph line, leads from Bizerta to Tunis. It traverses a very fertile plain, watered by the River Mejerda.

The route for the railway from Tunis has not yet been decided on, and no work in connection with it have been begun at Bizerta.

TUNIS (GOLETTA).

(MAY—JULY 1889.)

No modern coast defences are being at present erected at Goletta, or in the neighbourhood, nor could any torpedo boats be seen in the harbour. A battery of six field guns was parked in the arsenal.

Work is steadily proceeding in the new port of Tunis, both in the dredging of the canal through the lake of Tunis, and in the extension of the northern breakwater, for which purpose a large number of heavy masonry blocks are stored at the entrance to the Goletta Harbour.

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* This informant, who seemed an intelligent man, apparently stated what he fully believed.

FURTHER INFORMATION REQUIRED.

A.—General.

Report on the defences of:—

(1.) Tenes, including—

Batterie du Bastion No. 1, dite de l'Est (classed 15th January 1885).

Batterie de l'Ouest (classed 15th January 1885, declassed 27th May 1889).

Blockhaus Sud (classed 27th May 1889).

(2.) Cherchell, including—

Batterie de Joinville (classed 15th January 1885, declassed 27th May 1889).

Batterie Zizerin (declassed 15th January 1885).

Blockhaus du Djebel-bab-Arous (classed 27th May 1889).

Blockhaus des Amandiers (classed 27th May 1889).

(3.) Sidi-Ferruch, including—

The fort with the attached Batterie de l'Ouest.

Batterie de l'Est.

(4.) La Calle—

Fort et batterie de la presqu'île.
Le poste du Moulin.
Fortin de la Croupe.

B.—Any alteration in the Defences of the other Ports, and the following Supplementary Information:—

Nemours.

Position, armament, zone of fire, &c., of the Batterie de la Falaise Est.

Oran.

Armament, zone of fire, &c., of the Batterie Saint Grégoire.

Position, armament, zone of fire, and full particulars as to the Batterie et Réduit du Canastel.

Arzew.

Report on the Blockhaus du Champ de Tir.

Algiers.

Supplementary notes on the Batterie de Sidi Ben Nour.

Dellys.

Armament of the Batterie du Baston No. 8.

Bougie.

Armament of the Batterie du Phare de Bouak.
Armament, zone of fire, &c., of the Batterie de la Pointe de Bouak.
Armament of the Batterie du Centre.

Collo.

Armament of the Batterie du Coudiat El Snad.
Position of the blockhouse of Coudiat El Snad.

Philippeville.

Armament of the Batterie de Beni Melek.
Armament, zone of fire, plan, &c., of the Batterie d'El Kantara.

Bone.

Armament, zone of fire, plan, &c., of the Batterie du Fort Genois.

Bizerta.

Progress of harbour works, depth of water in old canal.
Has the new entrance to lake been begun yet?
Have any coast batteries been begun yet?

This Paper is transmitted for the personal information

of the DMI

by direction of the Secretary of State for War,

and is to be considered ~~strictly Confidential~~. Secret

No. 8

SECRET.

List of Maps and Plans to accompany Report on the Coast Defences of Algeria.

Intelligence Division, War Office, 1890.

Plan.

A.—Nemours.

B.—Oran. Plan of town.

C.—Oran. Fort du Santon.

D.—Oran. Fort et Batterie Lamoune.

E.—Oran. Batterie du Chateau Neuf.
Batterie de Mers El Kebir.

F.—Oran. Batterie du Ravin Blanc.

G.—Arzew.

I.—Algiers. Bay and neighbourhood.

II.—Algiers. Plan of town.

III.—Algiers. Batterie des Arcades.

IV.—Algiers. Fortin de Temendfous.

V.—Algiers. Fortin de l'Ouest.

Va.—Algiers. Batterie de Sidi Ben Nour.

VI.—Dellys.

VII.—Bougie.

VIII.—Djidjelli and Collo.

IX.—Phillippeville and neighbourhood.

X.—Phillippeville. Batterie de Skida

XI.—Bone and neighbourhood.

XII.—Bone. Batterie du Front, 31, 32.

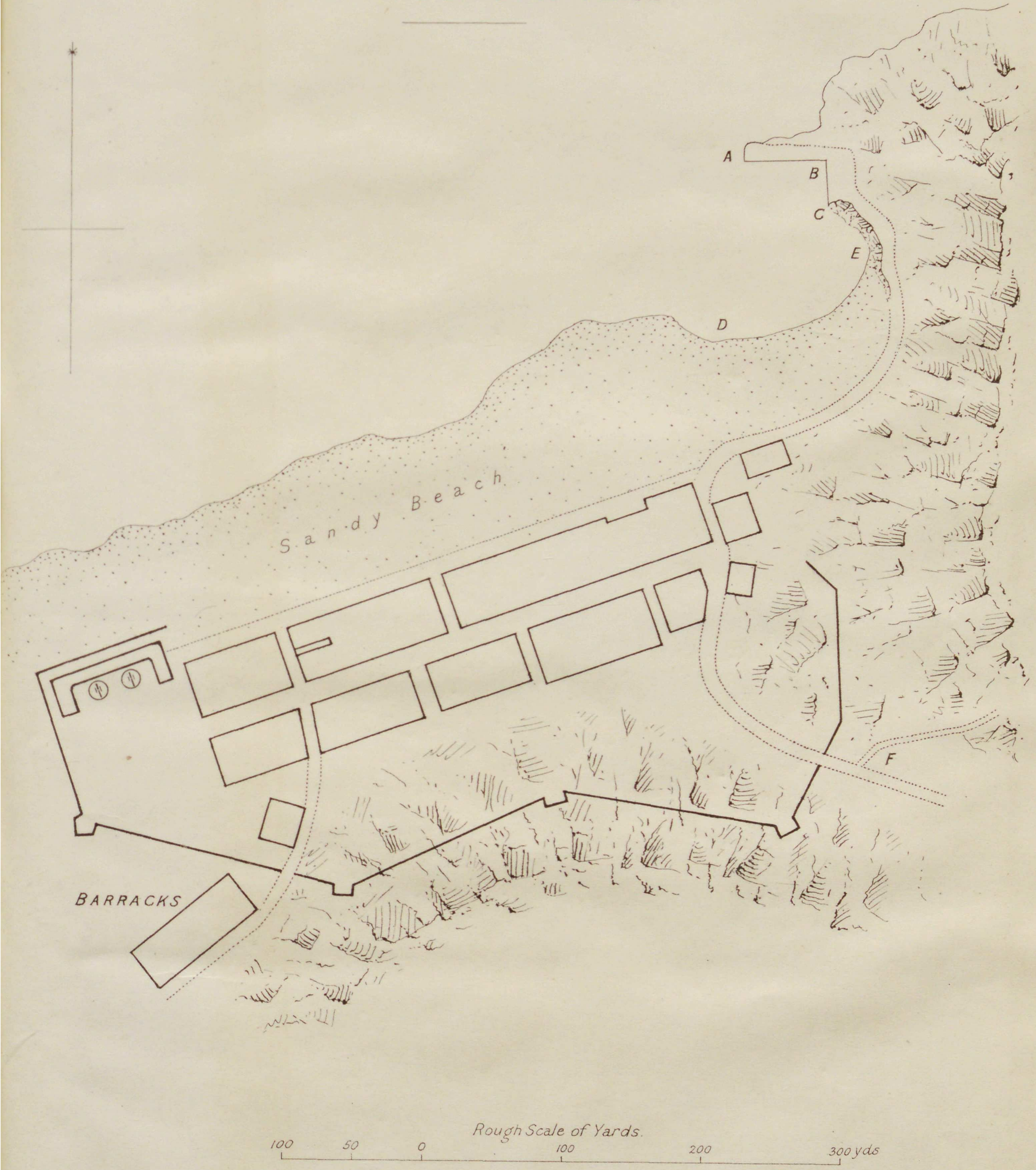
XIII.—Bone. Batterie des Caroubiers.

XIV.—Bizerta.

NEMOURS

SKETCH FROM MEMORY SHOWING

TOWN AND LANDING PLACE



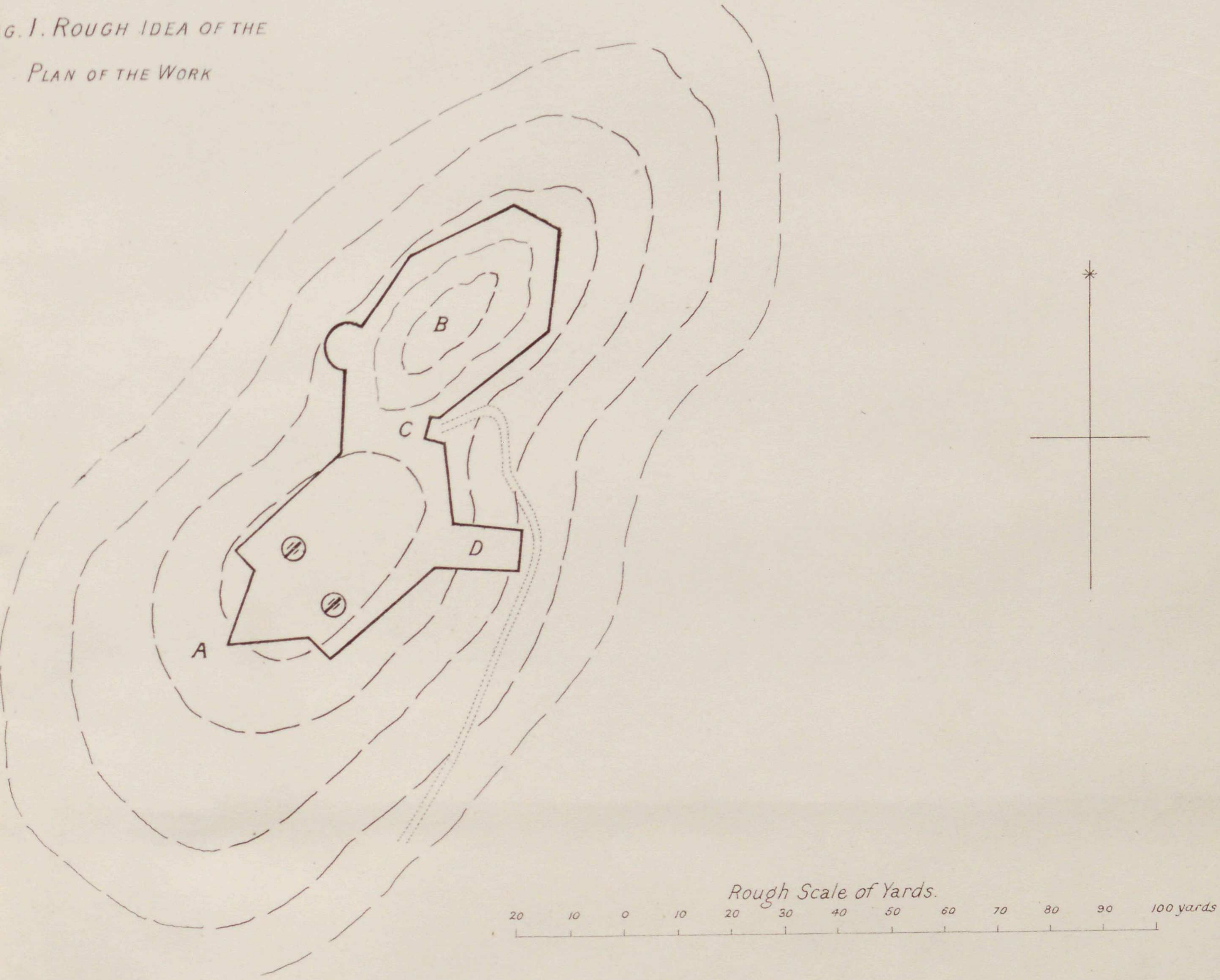
tell: Div: W.O. No.784(a)

ORAN

FORT DU SANTON

(MERS-EL-KEBIR)

FIG. 1. ROUGH IDEA OF THE PLAN OF THE WORK



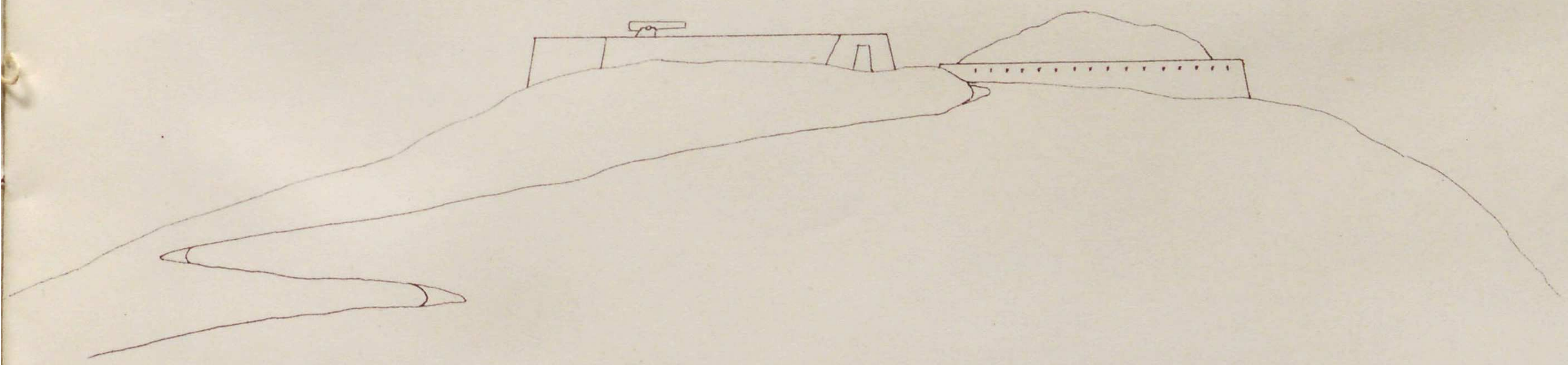
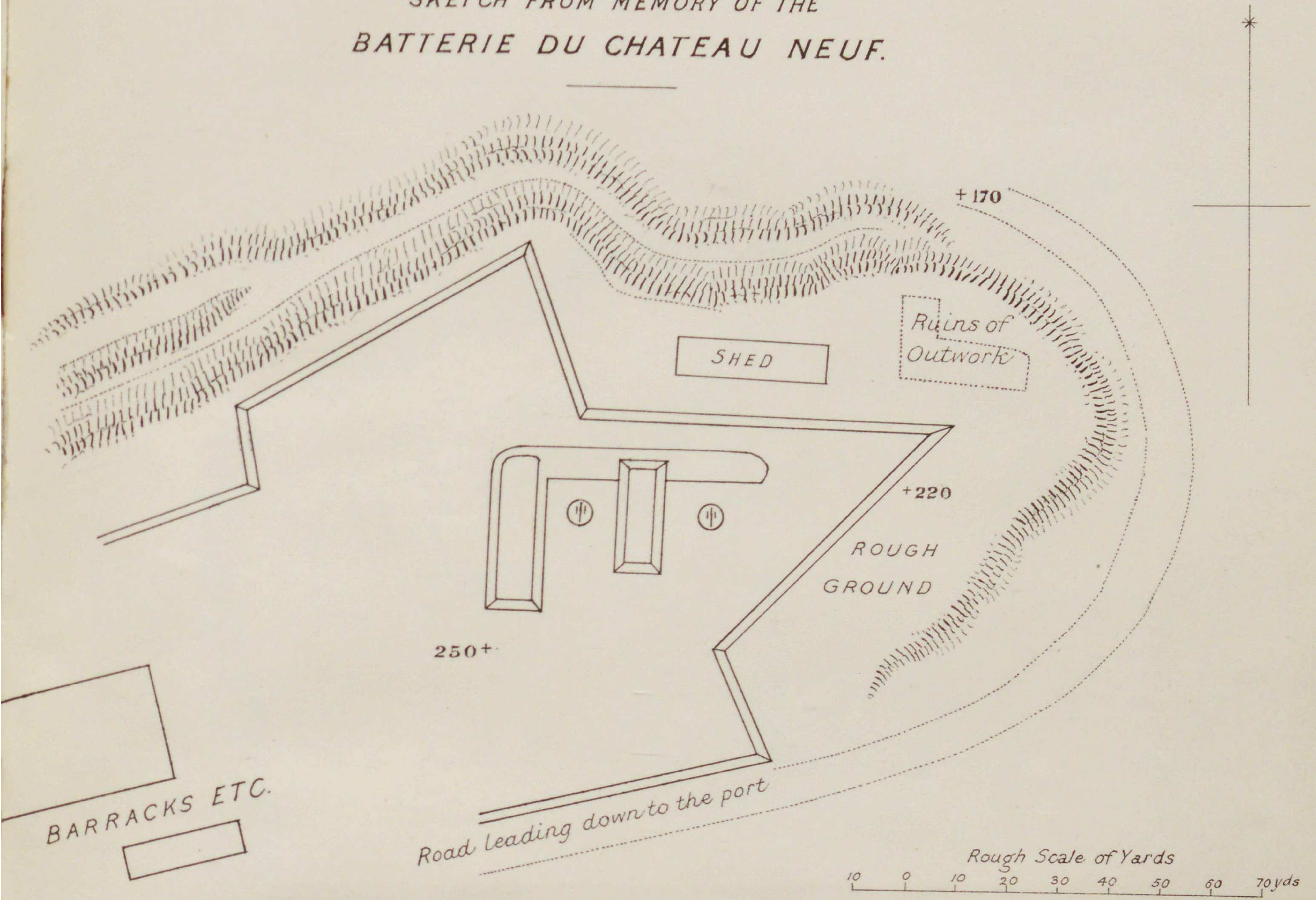


FIG. 2.
APPEARANCE OF WORK FROM NEAR ORAN

PL. E.

ORAN

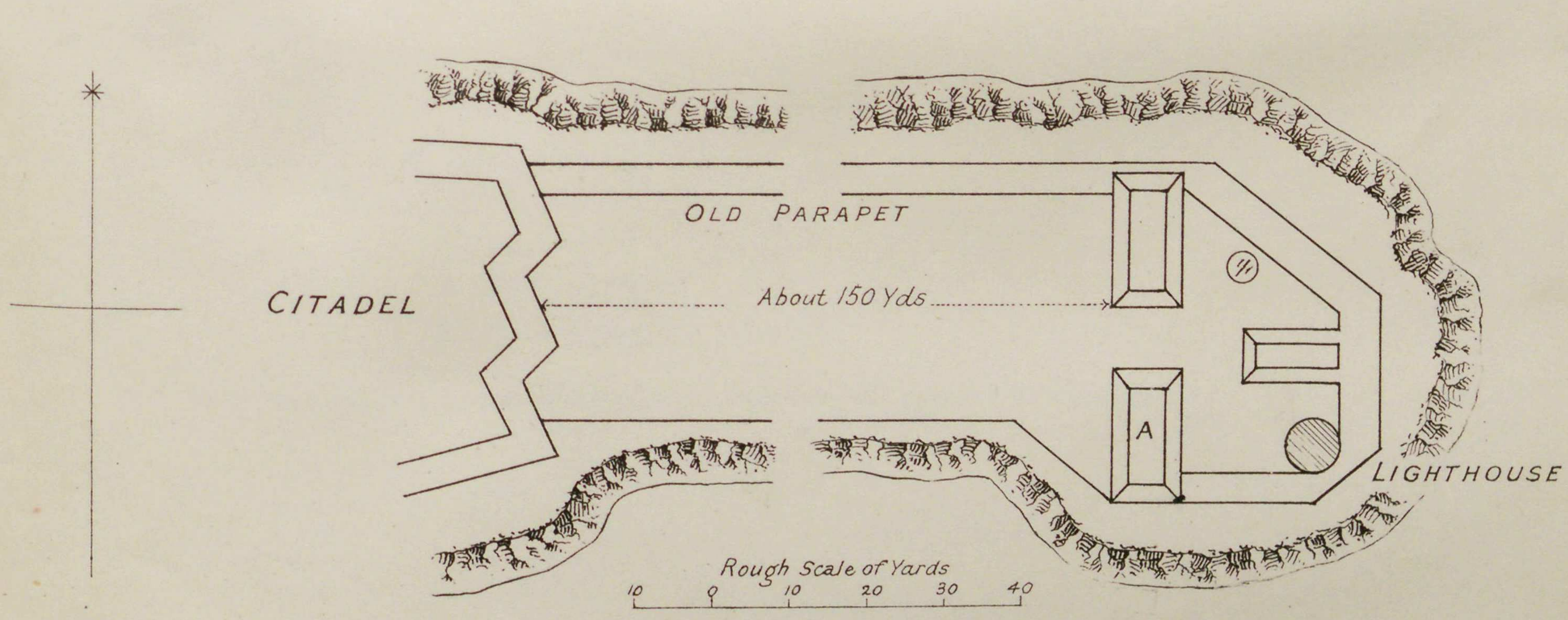
SKETCH FROM MEMORY OF THE
BATTERIE DU CHATEAU NEUF.



NOTE. THE FIGURES SHEW APPROXIMATE HEIGHTS IN FEET ABOVE SEA LEVEL.

ORAN

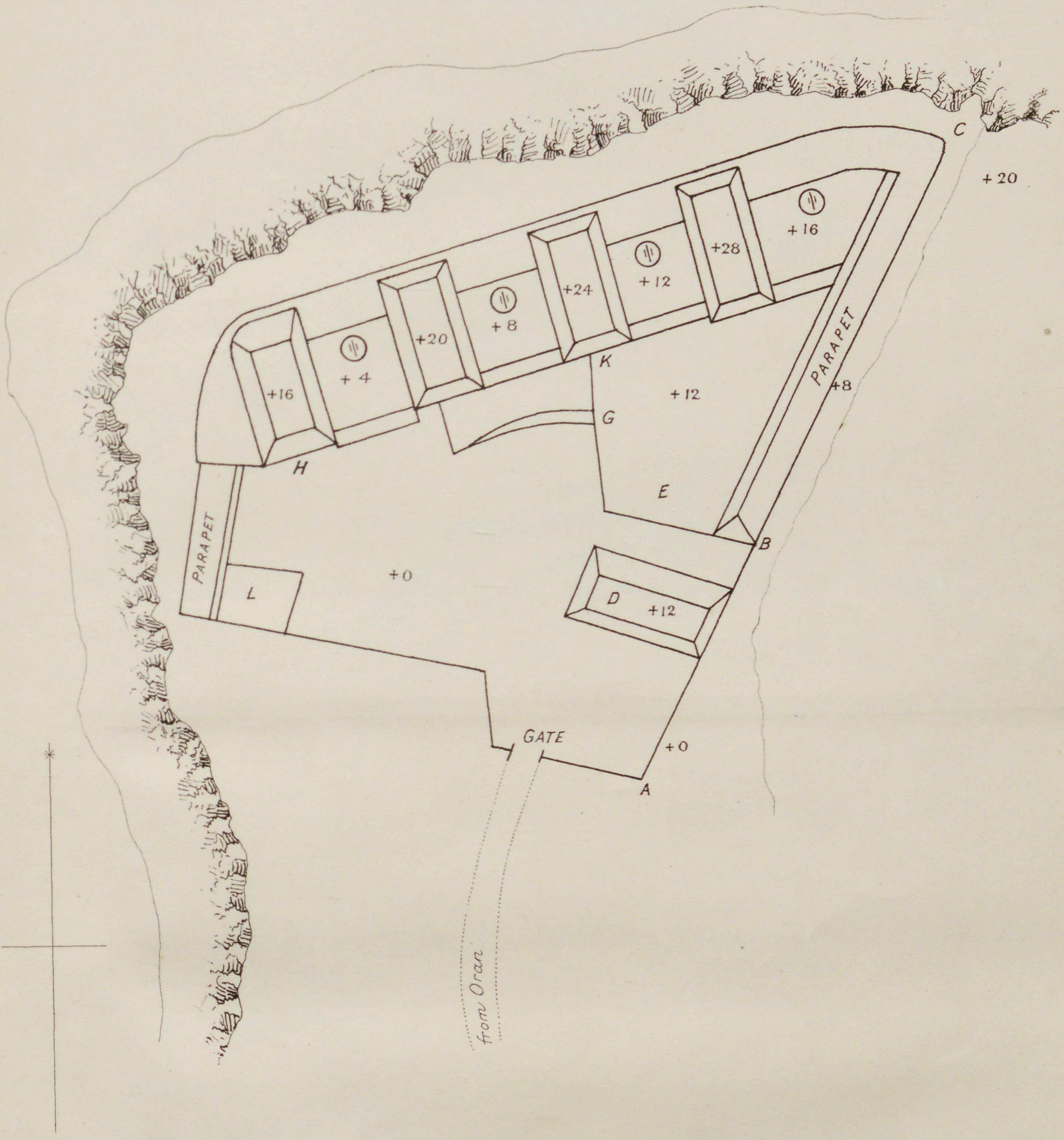
SKETCH FROM MEMORY OF THE
BATTERIE DE MERS EL-KEBIR.



ORAN

Pl. F.

SKETCH FROM MEMORY
OF THE
BATTERIE DU RAVIN BLANC



L. A. B. Wall about 12' high

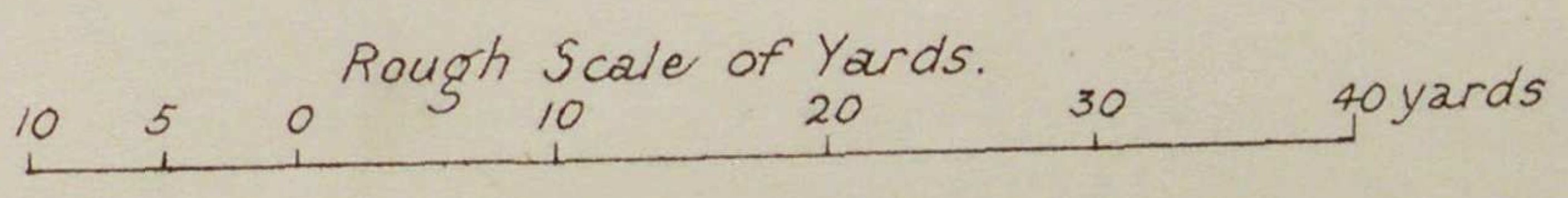
B. C. Ditch

D. Magazine

E. Raised platform

L. Small B.L. gun "en barbette"

NOTE. THE FIGURES SHEW APPROXIMATE HEIGHTS IN FEET ABOVE THE TERREPLEIN

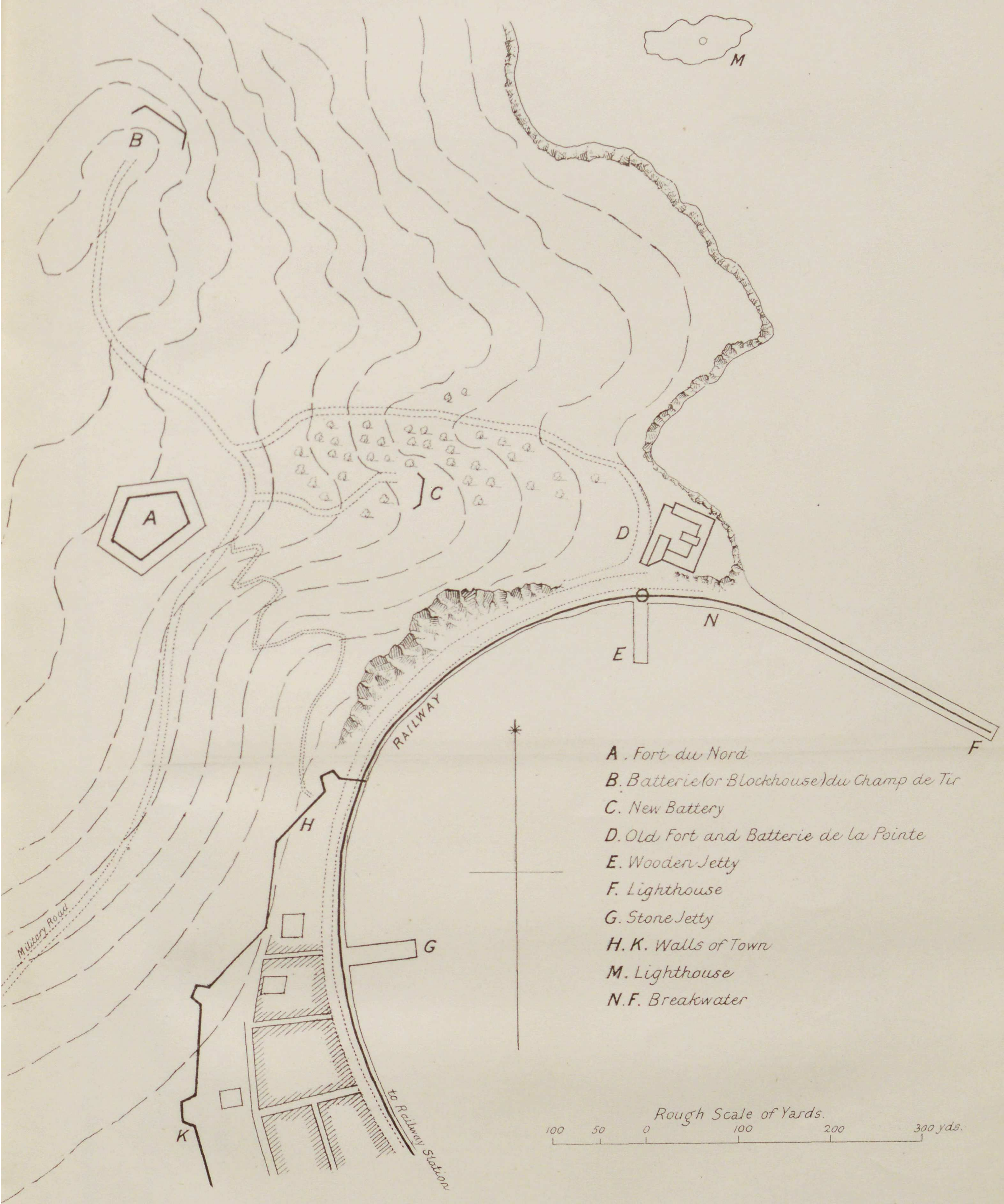


ARZEW.

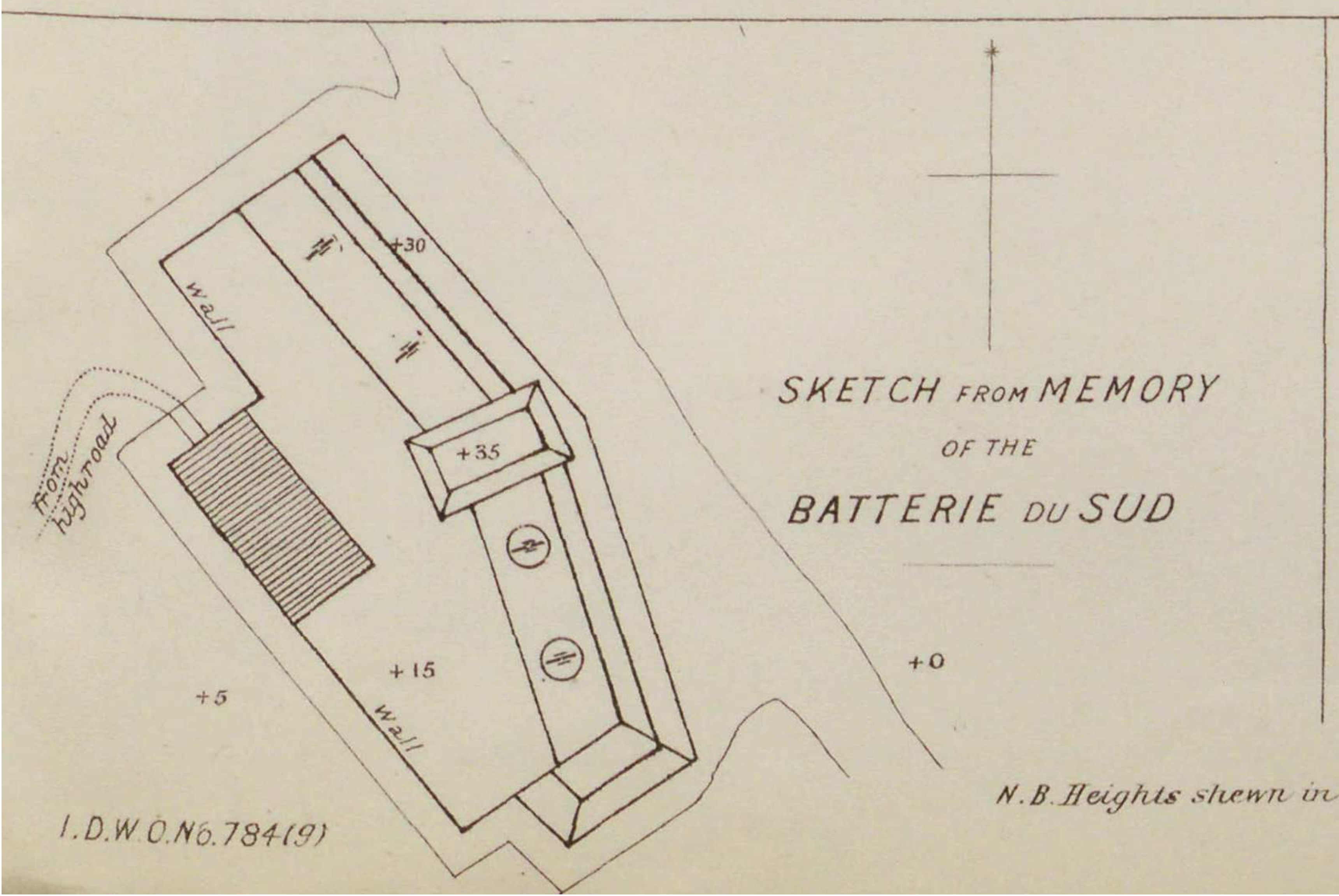
Pl. G.

SKETCH FROM MEMORY SHOWING RELATIVE POSITIONS OF THE COAST DEFENCES

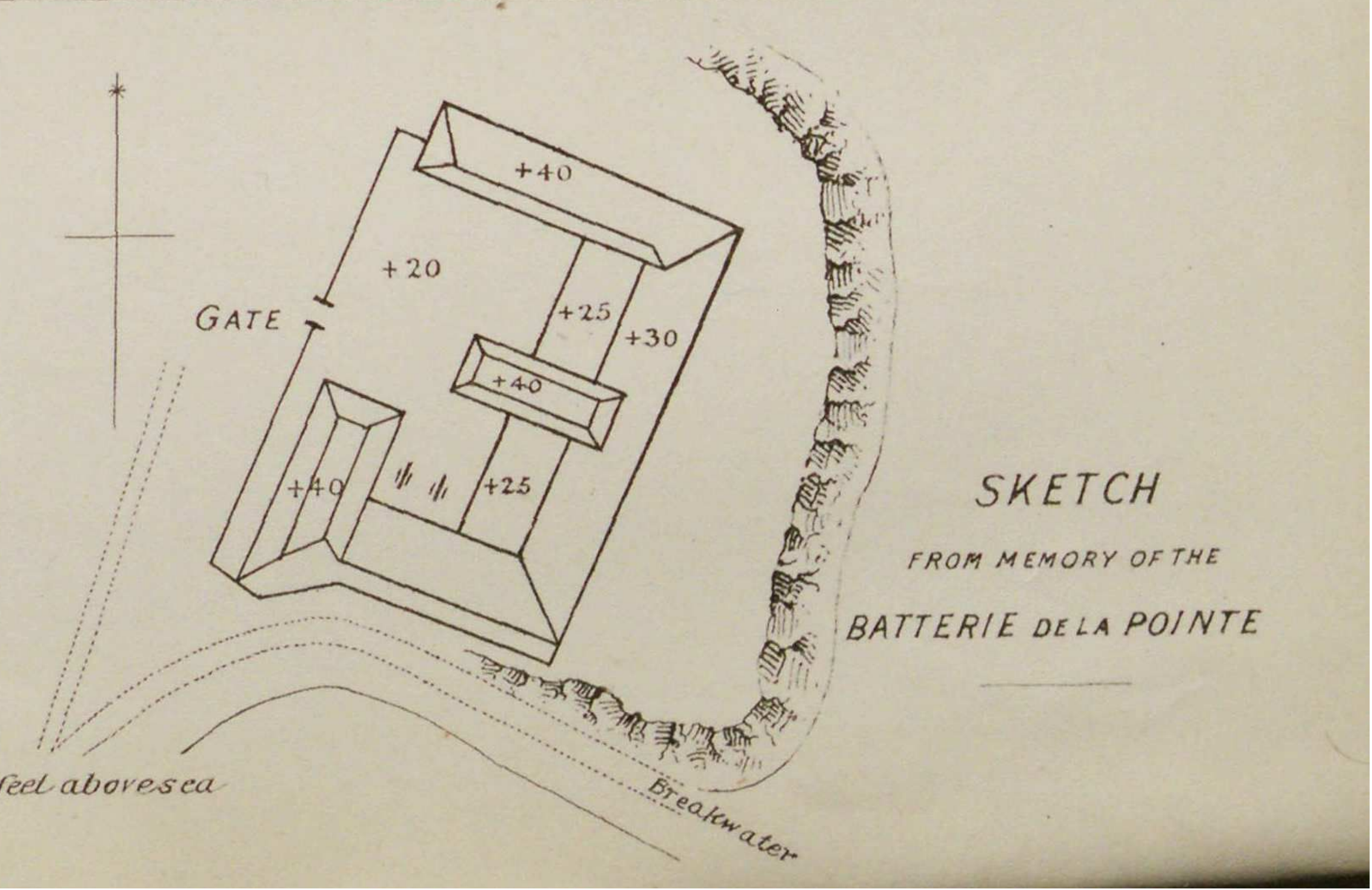
(EXCEPT THE BATTERIE DU SUD (see chart.)



A. Fort du Nord
B. Batterie (or Blockhouse) du Champ de Tir
C. New Battery
D. Old Fort and Batterie de la Pointe
E. Wooden Jetty
F. Lighthouse
G. Stone Jetty
H. K. Walls of Town
M. Lighthouse
N. F. Breakwater



SKETCH FROM MEMORY OF THE BATTERIE DU SUD

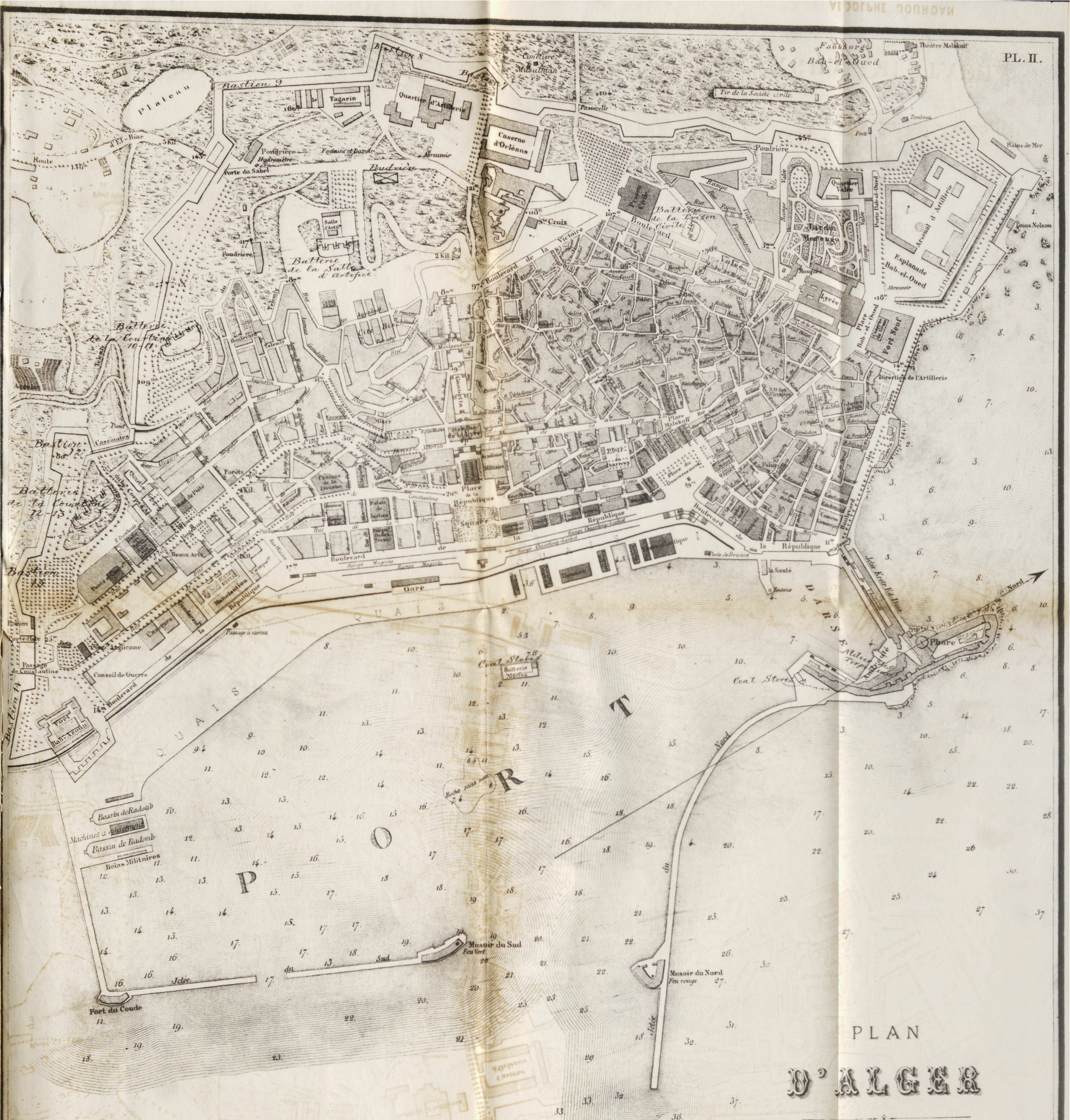


SKETCH FROM MEMORY OF THE BATTERIE DE LA POINTE

N.B. Heights shewn in feet above sea

I.D.W.O. No. 784(9)

PL. II.



PLAN
D'ALGER

AGHA-MUSTAPHA

publié par
ADOLPHE JOURDAN
Libraire-Editeur
ALGER

1888.

Légende.

■	*Etablissements Civils.*
▨	*Etablissements Militaires.*

Echelle de 1 Millimètre pour 5 Mètres.

Int. Div. W.O. No. 775 (b).

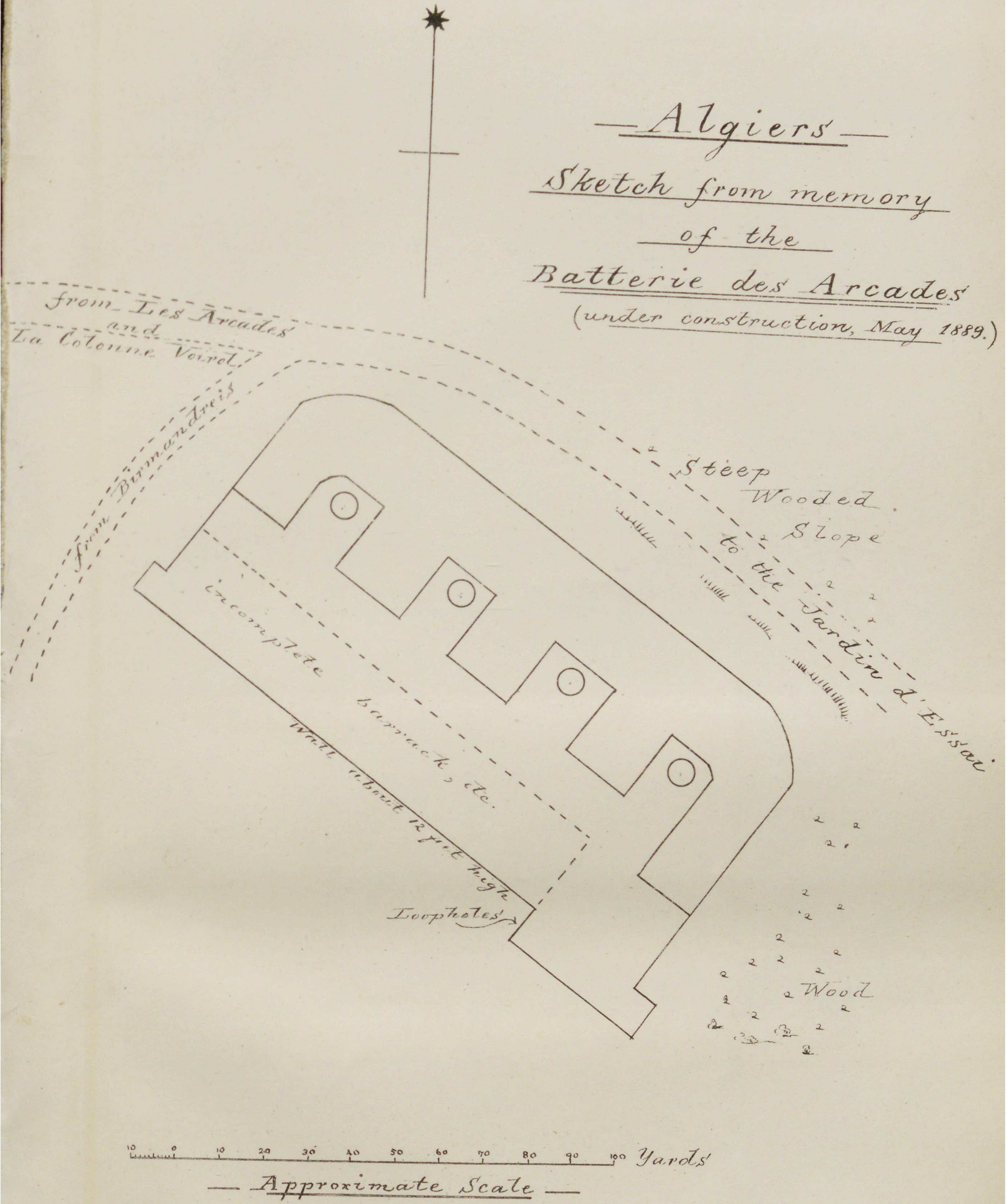
Lith. A. Jourdan

PL. III.

Algiers

Sketch from memory of the Batterie des Arcades

(under construction, May 1889.)



ntell: Div: W.O. Nº 775 (c)

PL. IV.

Algiers

Sketch from memory of the Fortin de Temendfous

Intell: Div: W.O. No 775(a)

Algiers
Sketch from memory of the Fortin de l'Ouest

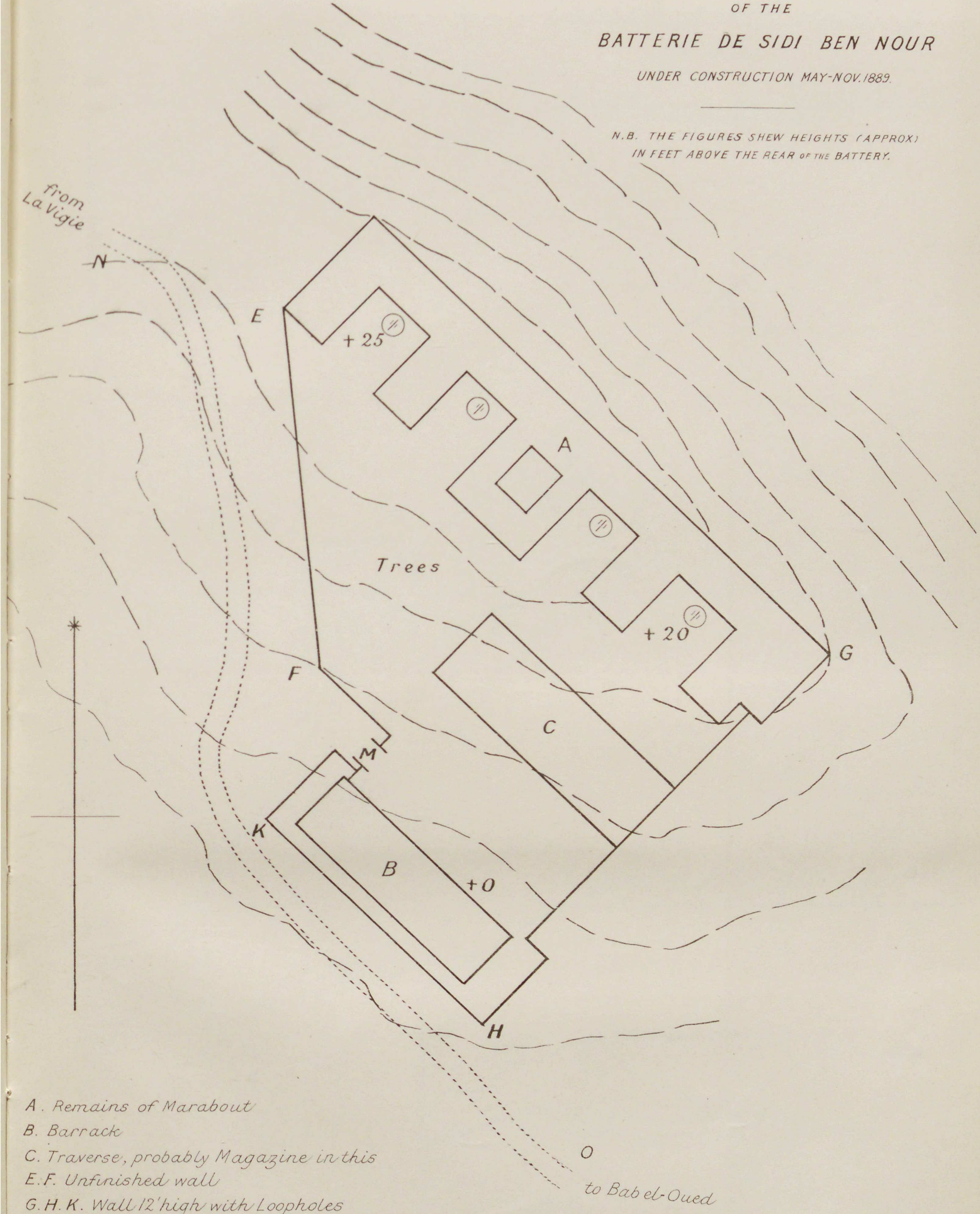
Intell: Div: W.O. No. 775 (e).

PL. V(A)

ALGIERS

SKETCH FROM MEMORY
OF THE
BATTERIE DE SIDI BEN NOUR
UNDER CONSTRUCTION MAY-NOV. 1889.

N.B. THE FIGURES SHEW HEIGHTS (APPROX) IN FEET ABOVE THE REAR OF THE BATTERY.



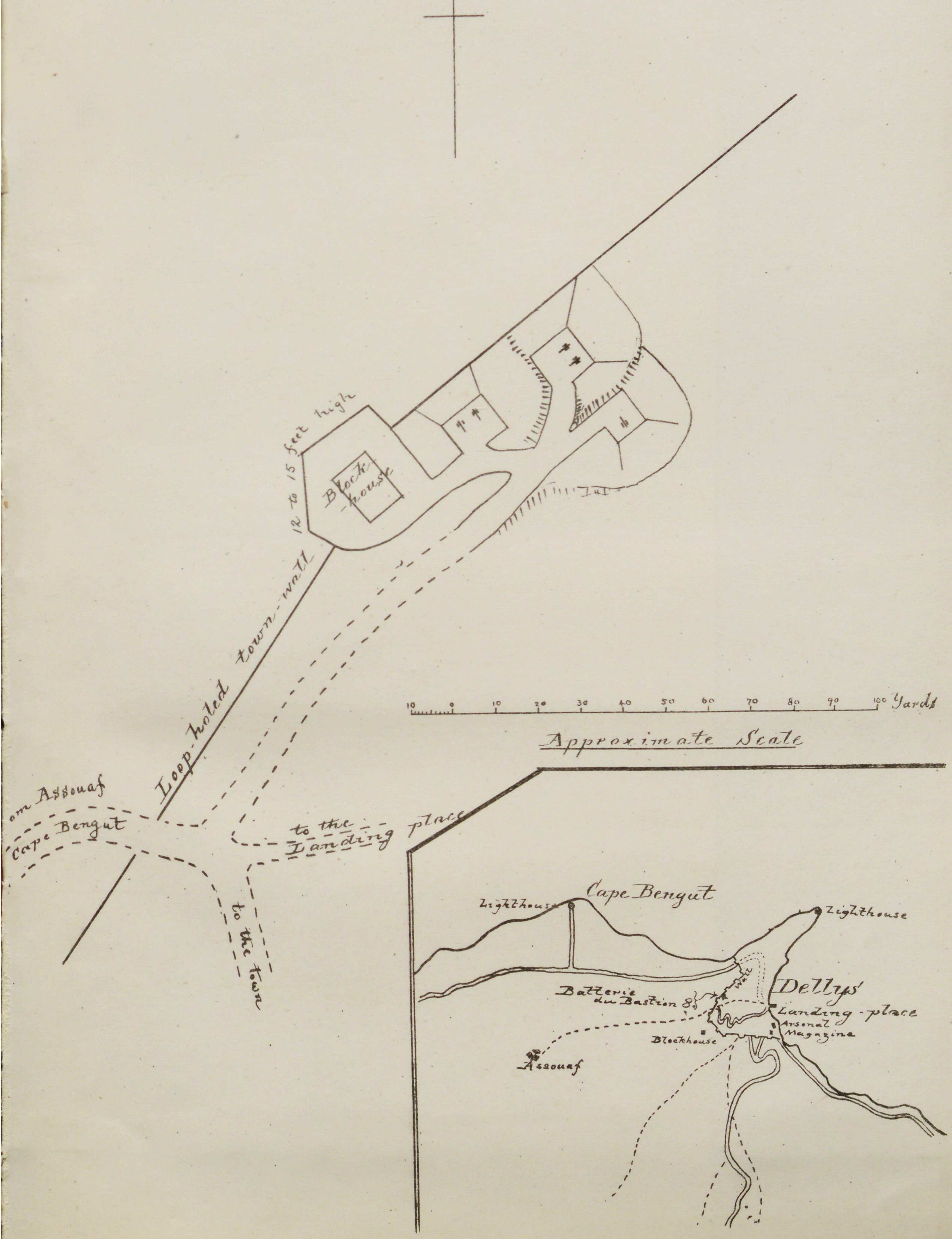
A. Remains of Marabout
B. Barrack
C. Traverse, probably Magazine in this
E.F. Unfinished wall
G.H.K. Wall 12' high with Loopholes
M. Unfinished Gate
N.O. Rough road from La Vigie down to Bab el-Oued

Rough Scale of Yards
10 5 0 10 20 30 40 yds.

Intell: Div: W.O. No. 784(h)

PL. VI.

Dellys
Sketch from memory of the Batterie du Bastion 8.



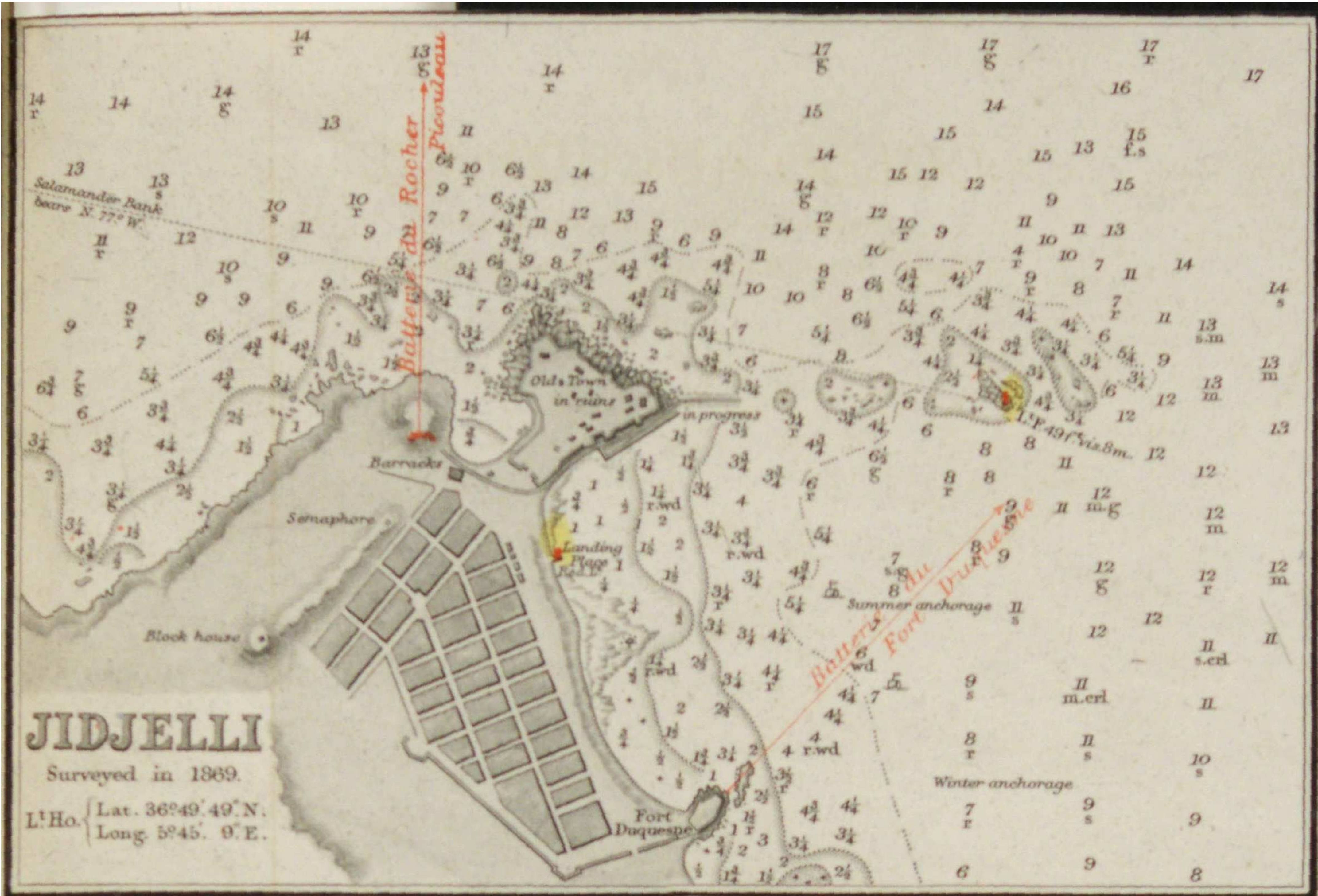
ntell: Div: W.O. Nº 775(f)

PL. VII.

Sketch Map showing, from memory, the position of coast batteries at Bougie

Cutting from Admiralty Chart N.º 178.

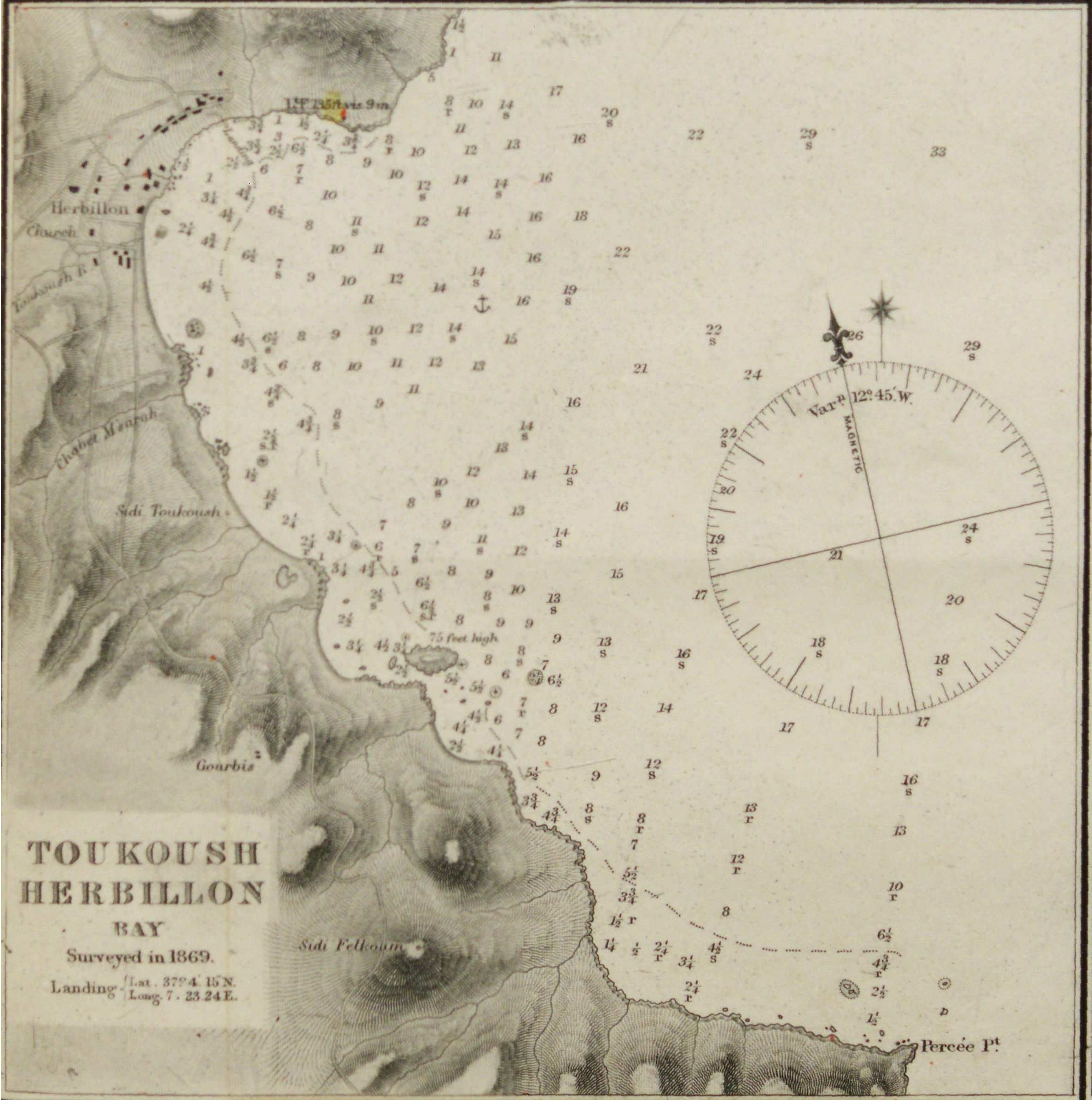
PL. VIII.



JIDJELLI

Surveyed in 1869.

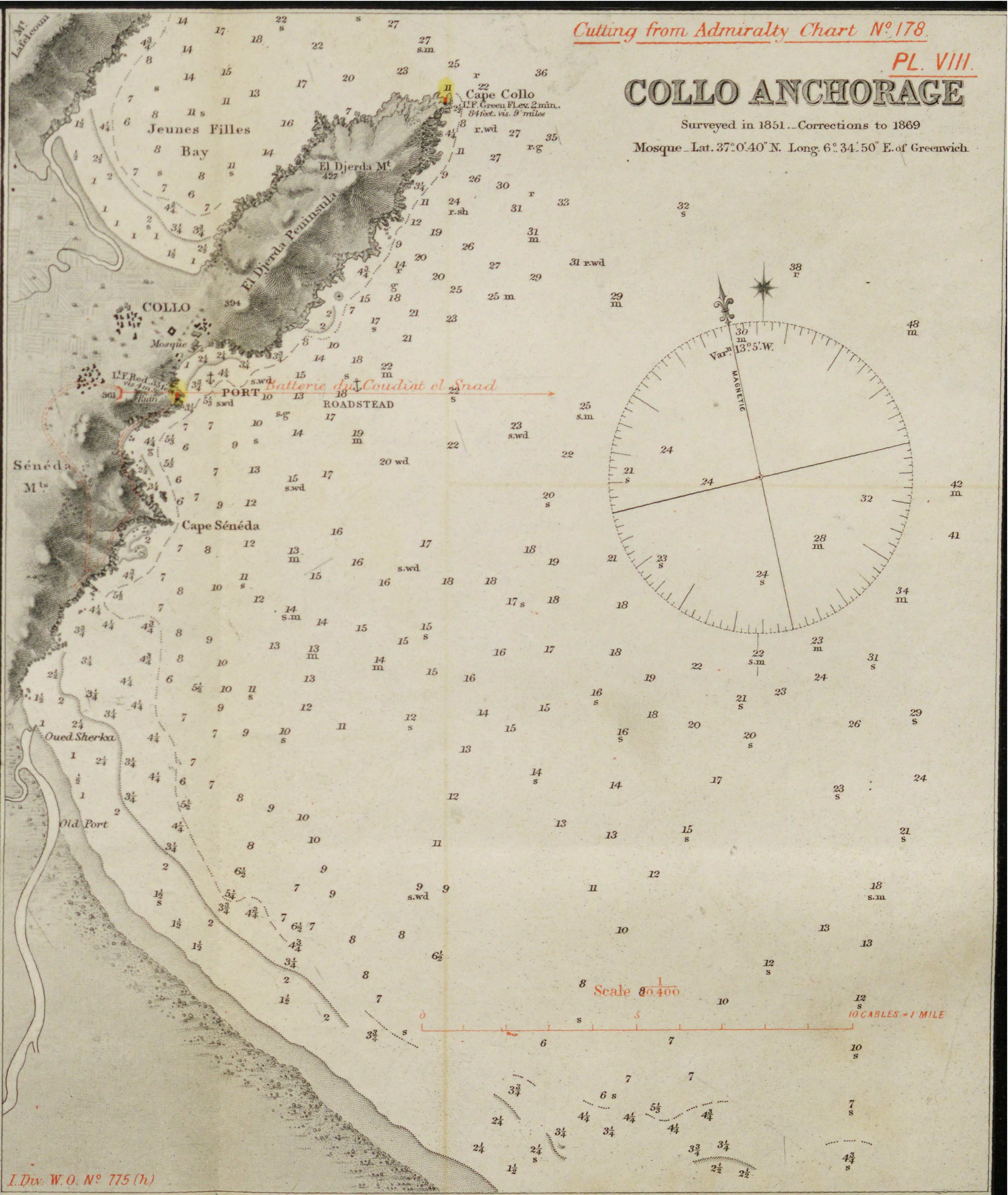
L.t Ho. { Lat. 36°49′49″N. / Long. 5°45′ 9″E.



TOUKOUSH HERBILLON BAY

Surveyed in 1869.

Landing { Lat. 37°4′ 15″N. / Long. 7. 23 24 E.



COLLO ANCHORAGE

Surveyed in 1851. Corrections to 1869

Mosque. Lat. 37°0′40″ N. Long. 6°34′50″ E. of Greenwich

nall corrections IX.79. IV 81. VII 81. XII·84. II·86

London. Published at the Admiralty, 20.th July 1866, under the Superintendence of Cap.t
Sold by J. D. Potter, Agent for the Admiralty Charts, 31, Poultry, & 11, Ki

PL. X.

Philippeville

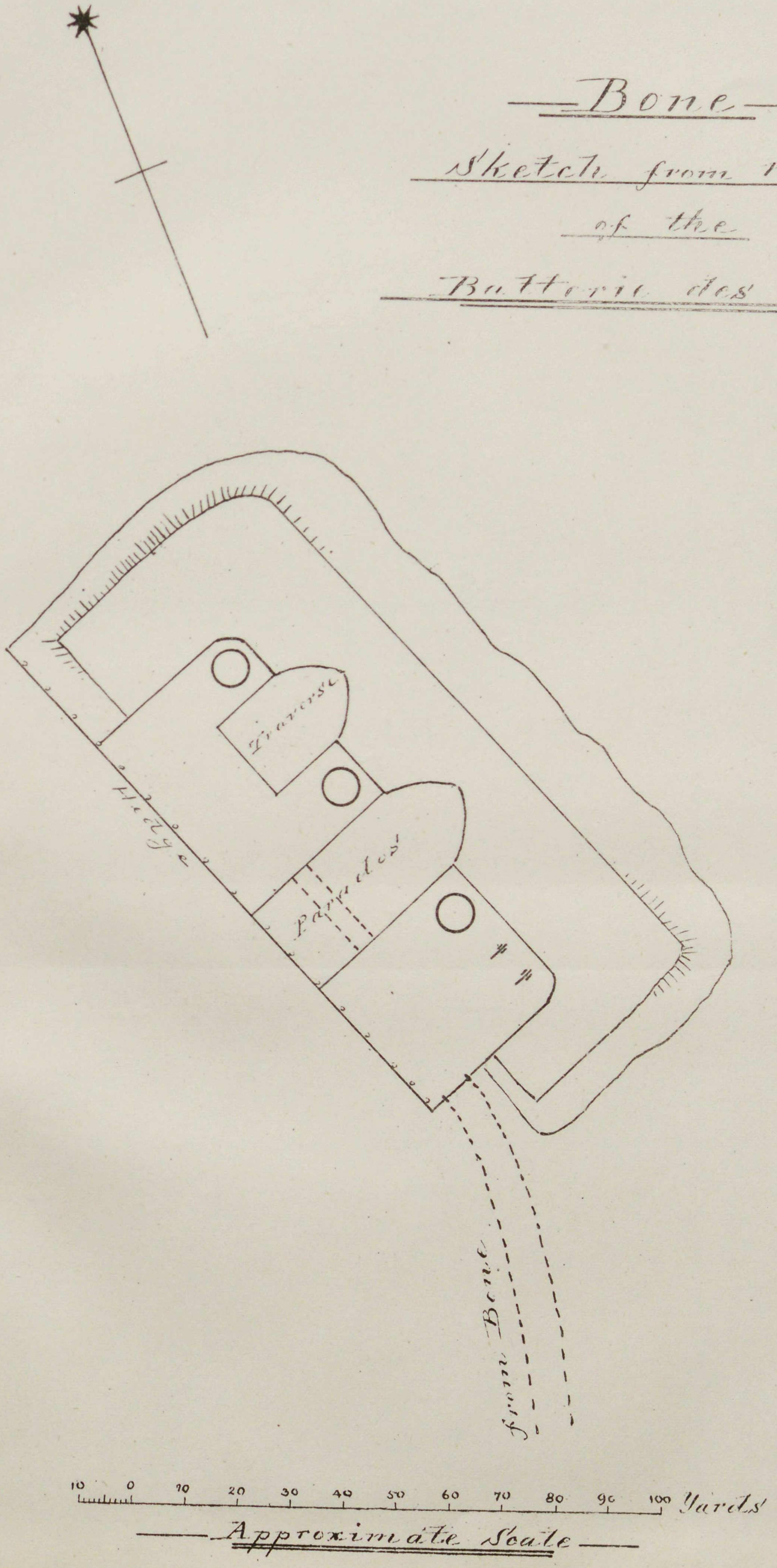
Sketch from memery of the Batterie de Skida

Approximate Scale

U: Div: W. O. No 775(k)

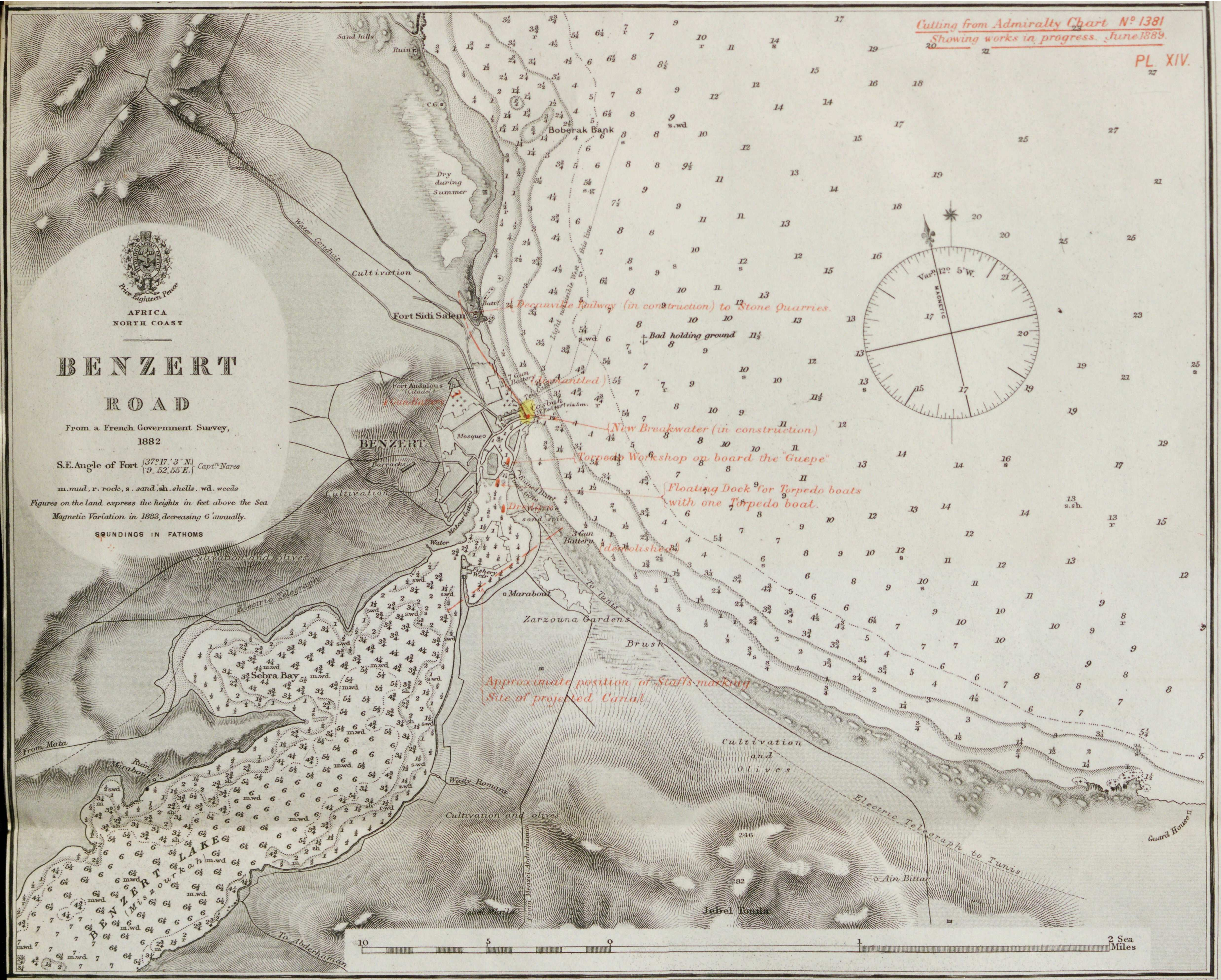
Bone

Sketch from memory of the Batterie des Carroubiers



Cutting from Admiralty Chart No 1381
Showing works in progress. June 1889.

PL. XIV.



AFRICA
NORTH COAST

BENZERT
ROAD

From a French Government Survey,
1882

S.E. Angle of Fort {37°17.′3″N. / 9.52.55 E.} Captn Nares

m. mud, r. rock, s. sand, sh. shells, wd. weeds
Figures on the land express the heights in feet above the Sea
Magnetic Variation in 1883, decreasing 6′ annually.

SOUNDINGS IN FATHOMS

Price Eighteen Pence

{Decauville Railway (in construction) to Stone Quarries.

(dismantled)

4 Gun Battery

{New Breakwater (in construction)

{Torpedo Workshop on board the "Guepe"

{Floating Dock for Torpedo boats
with one Torpedo boat.

Dredger

(demolished)

Approximate position of Staffs marking
Site of projected Canal

L. Div. W.O. No 775(a)

e Hydrographic Office of the Admiralty May 13th 1846. Large corrections Octr 1883.
Charts 31 Poultry & 11 King St Tower Hill.

J.& C. Walker Sculpt

1381